

PhD thesis presented by

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UNIVERSITAT POLITÈCNICA DE CATALUNYA

***Development of the new AINA code  
and its application to the Safety  
Analysis of the European DEMO designs***

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UNIVERSITAT POLITÈCNICA  
DE CATALUNYA  
BARCELONATECH

Directors:

**Alfredo de Blas del Hoyo  
Albert Riego Pérez**

## ANNEX A: HCPB graphics

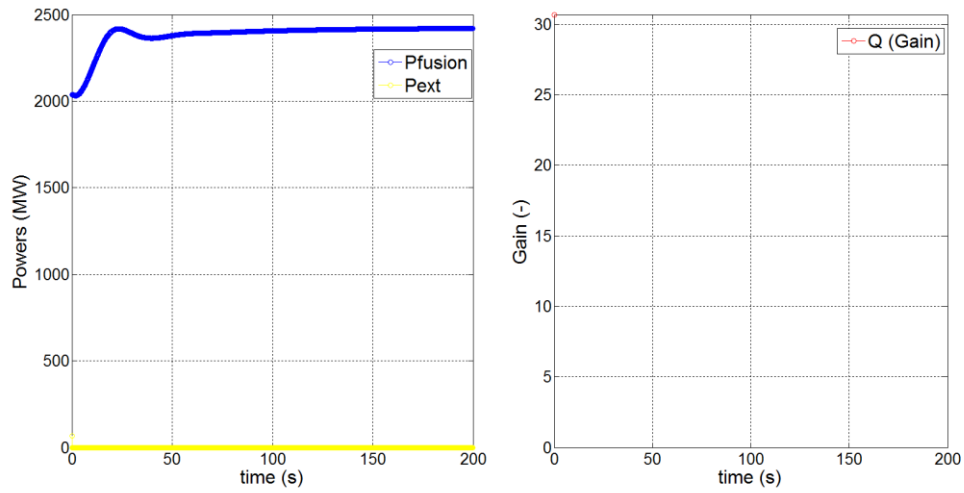


Figure 1: HCPB DEMO1 Auxiliary Heating Cut-off  $P_{fus}$  and gain graphic.

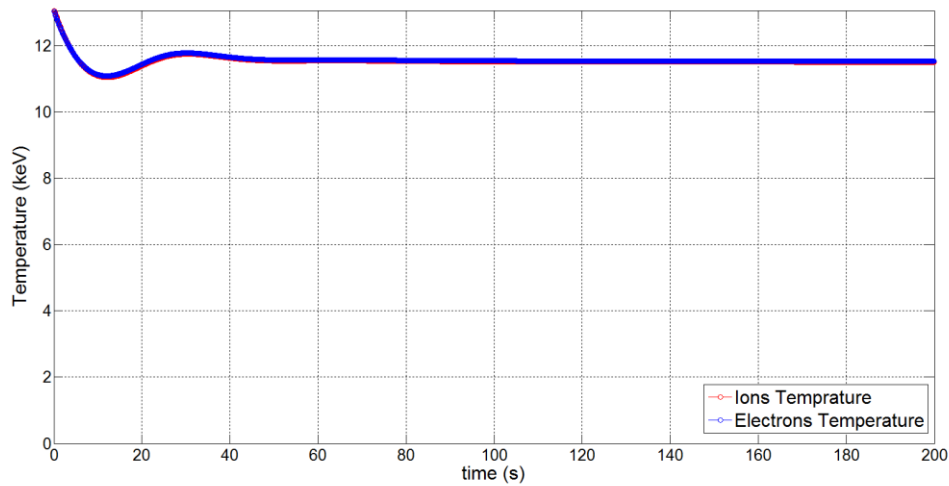


Figure 2: HCPB DEMO1 Auxiliary Heating Cut-off Temperatures graphic.

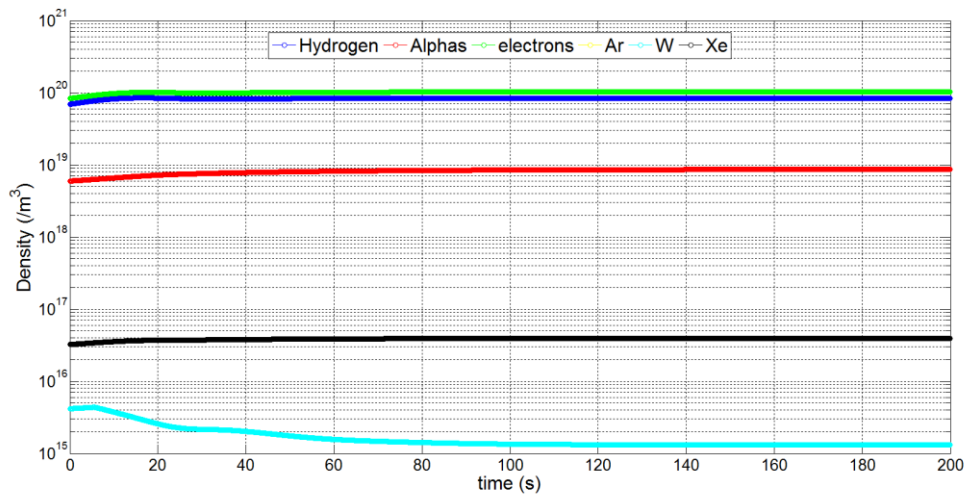


Figure 3: HCPB DEMO1 Auxiliary Heating Cut-off Densities graphic.

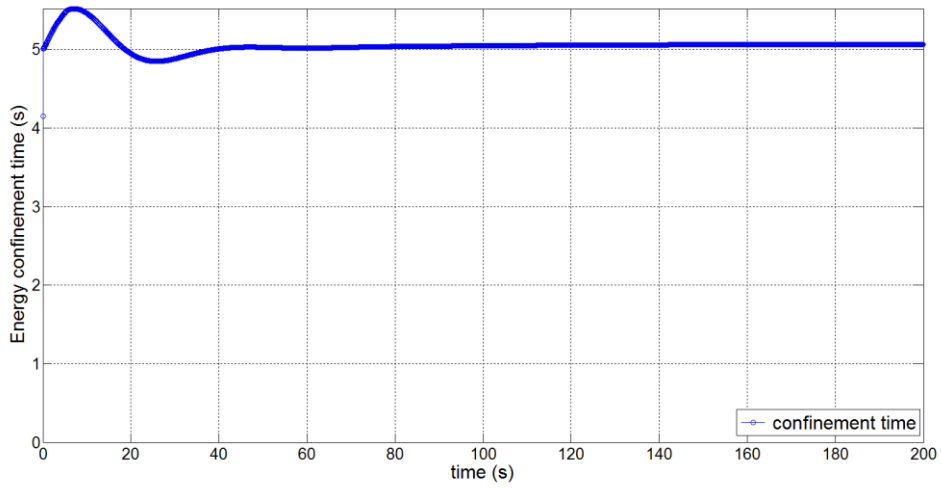


Figure 4: HCPB DEMO1 Auxiliary Heating Cut-off Confinement time graphic.

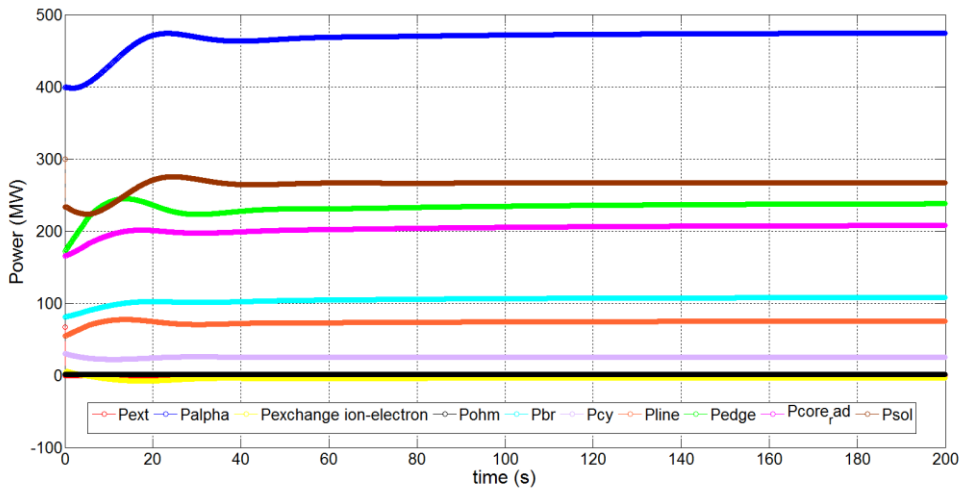


Figure 5: HCPB DEMO1 Auxiliary Heating Cut-off Powers graphic.

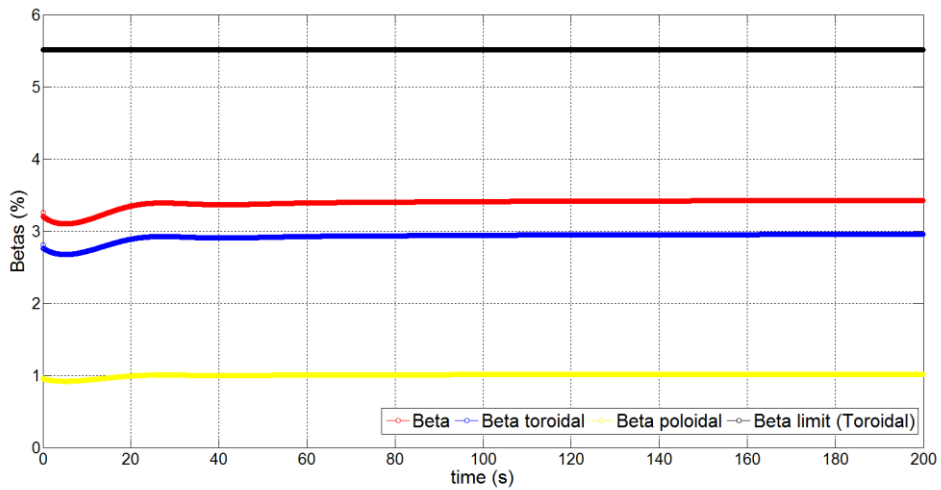


Figure 6: HCPB DEMO1 Auxiliary Heating Cut-off Betas graphic.

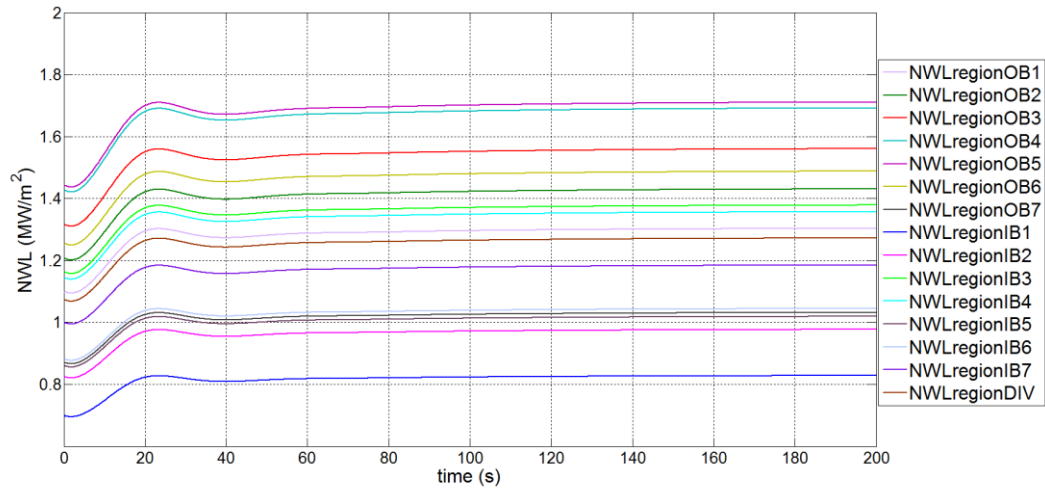


Figure 7: HCPB DEMO1 Auxiliary Heating Cut-off NWL graphic.

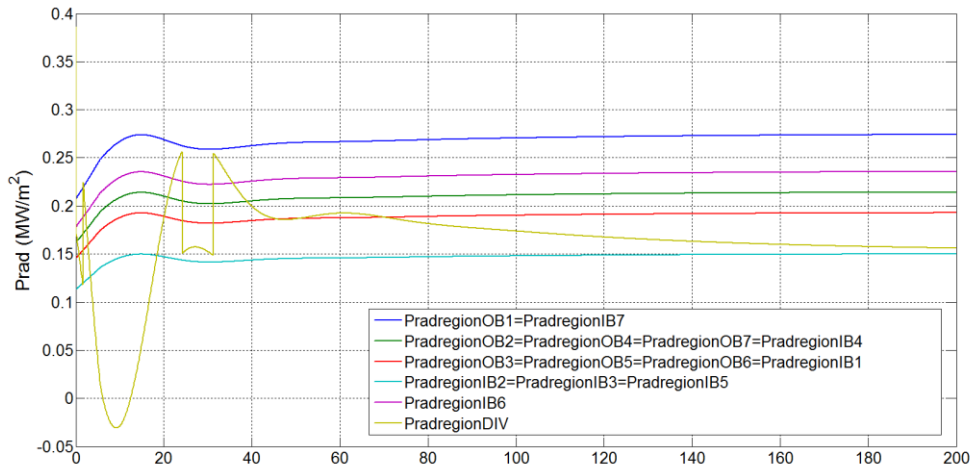


Figure 8: HCPB DEMO1 Auxiliary Heating Cut-off  $P_{rad}$  graphic.

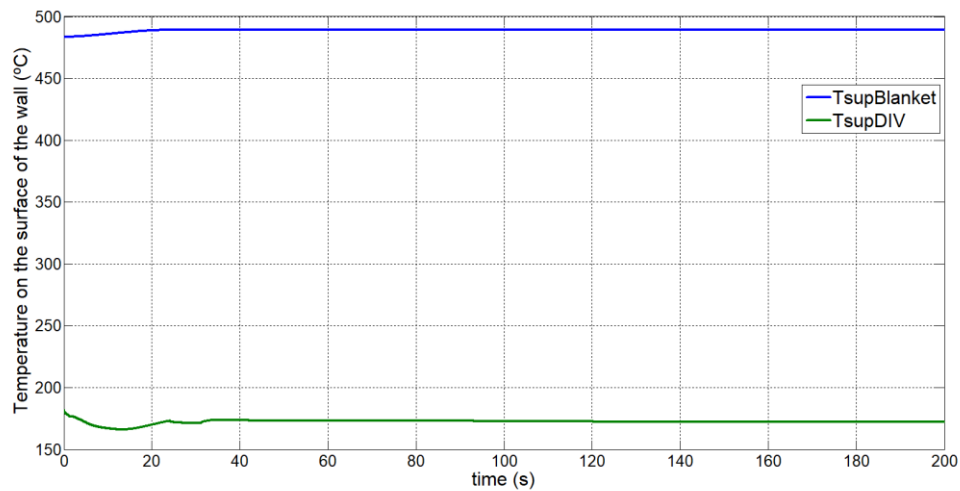


Figure 9: HCPB DEMO1 Auxiliary Heating Cut-off Temperature on the surface of the blanket and divertor wall graphic.

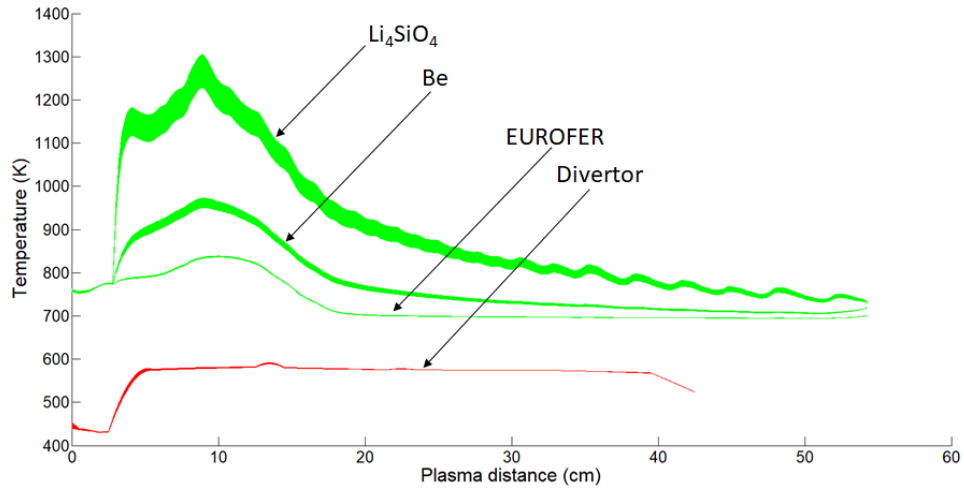


Figure 10: HCPB DEMO1 Auxiliary Heating Cut-off evolution of the BB and divertor temperature graphic.

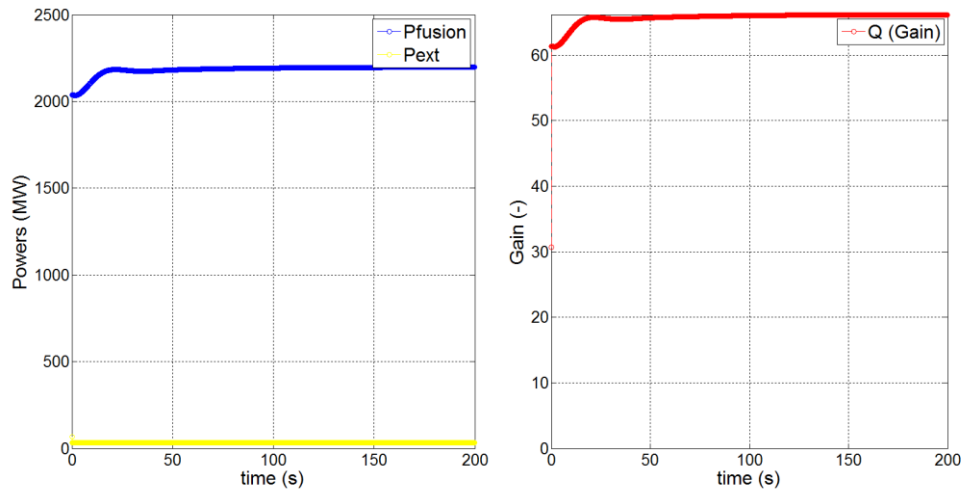


Figure 11: HCPB DEMO1 Auxiliary Heating sudden decrease  $\times 0.5 P_{fus}$  and gain graphic.

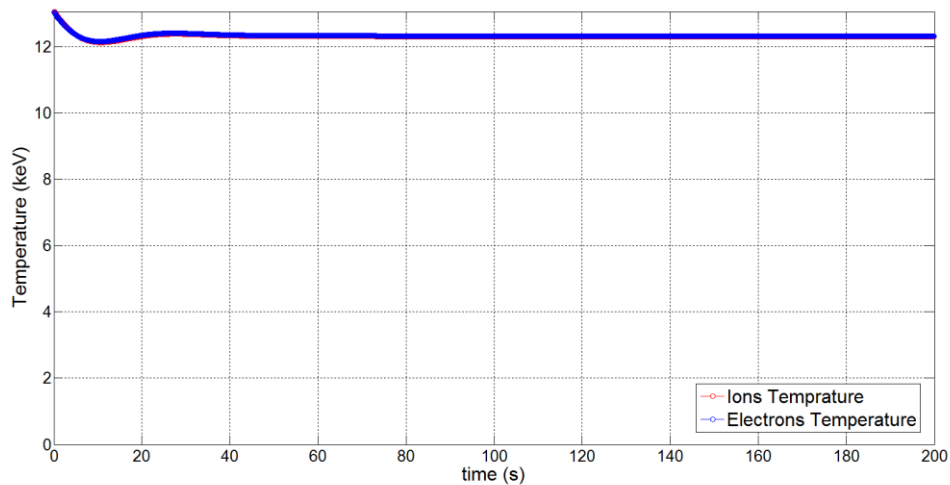


Figure 12: HCPB DEMO1 Auxiliary Heating sudden decrease  $\times 0.5$  Temperatures graphic.

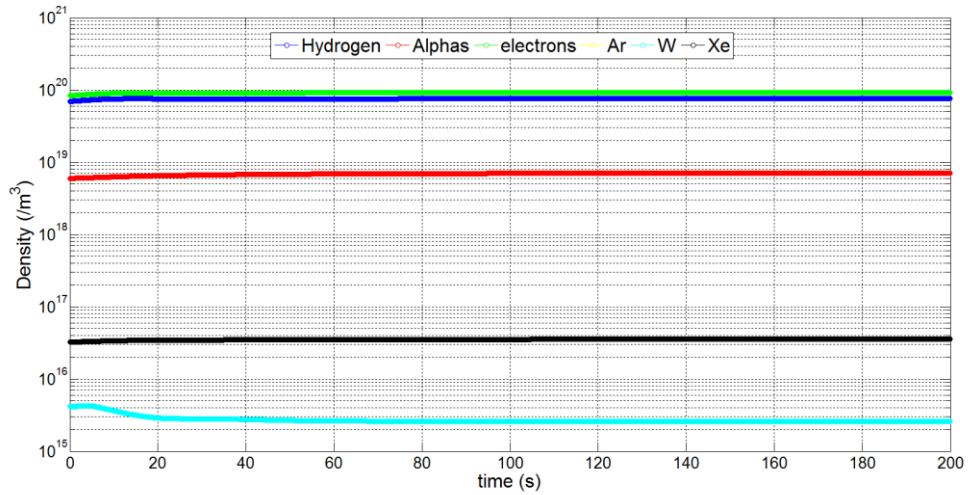


Figure 13: HCPB DEMO1 Auxiliary Heating sudden decrease x0.5 Densities graphic.

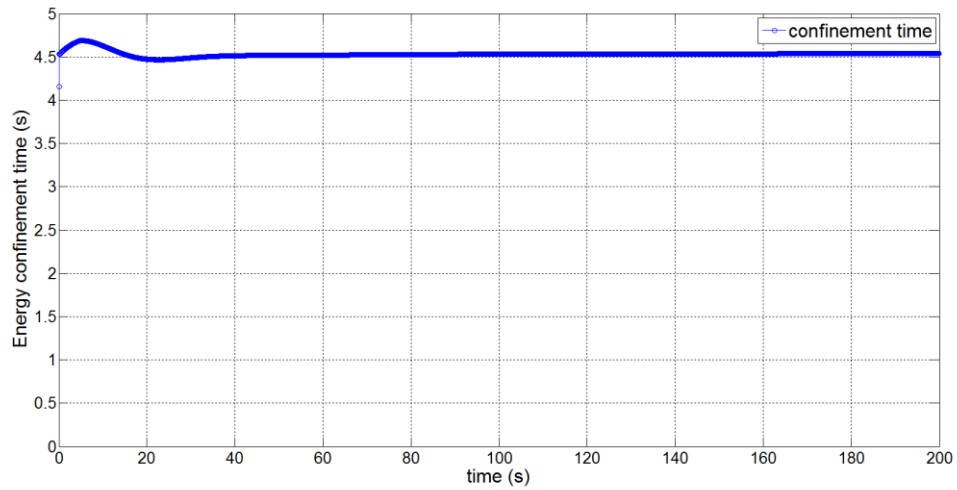


Figure 14: HCPB DEMO1 Auxiliary Heating sudden decrease x0.5 Confinement time graphic.

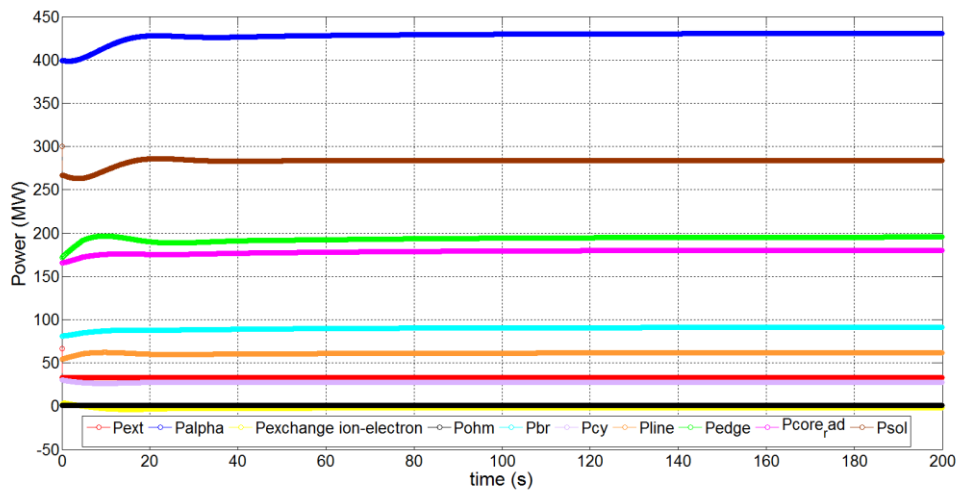


Figure 15: HCPB DEMO1 Auxiliary Heating sudden decrease x0.5 Powers graphic.

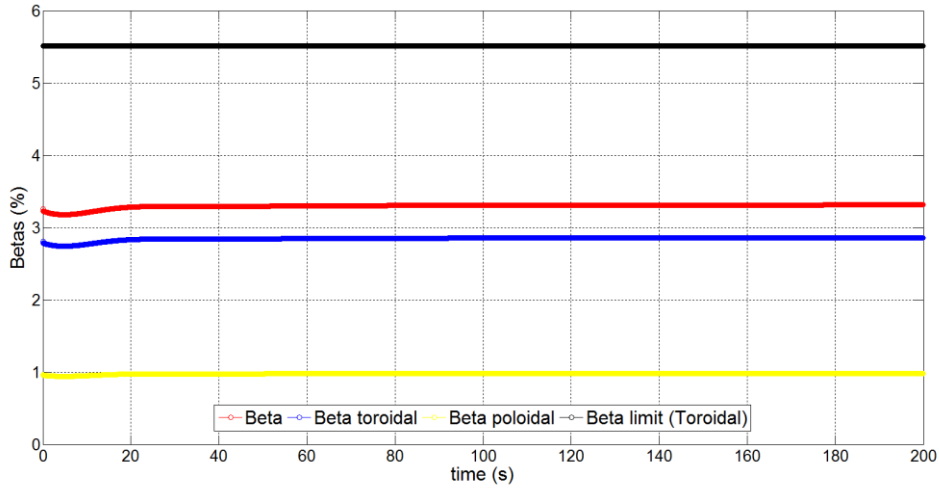


Figure 16: HCPB DEMO1 Auxiliary Heating sudden decrease x0.5 Betas graphic.

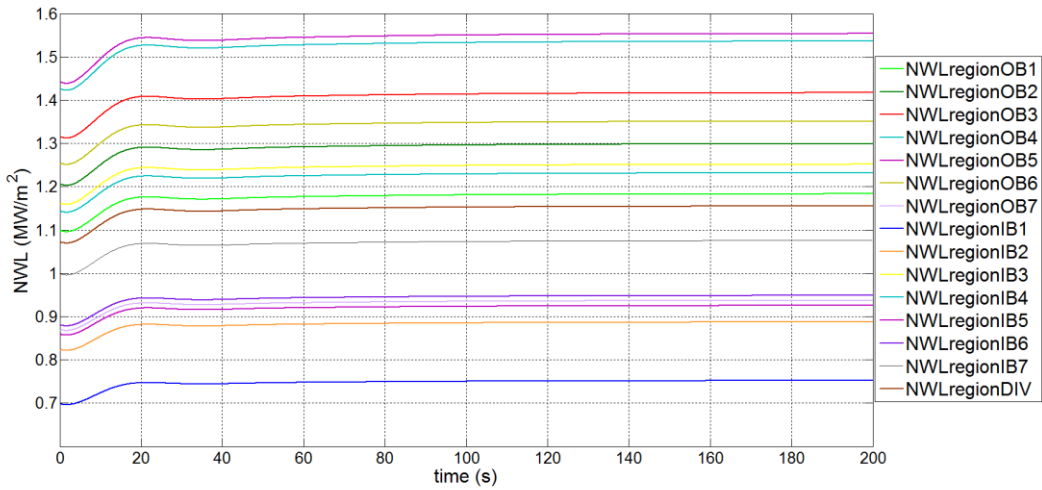


Figure 17: HCPB DEMO1 Auxiliary Heating sudden decrease x0.5 NWL graphic.

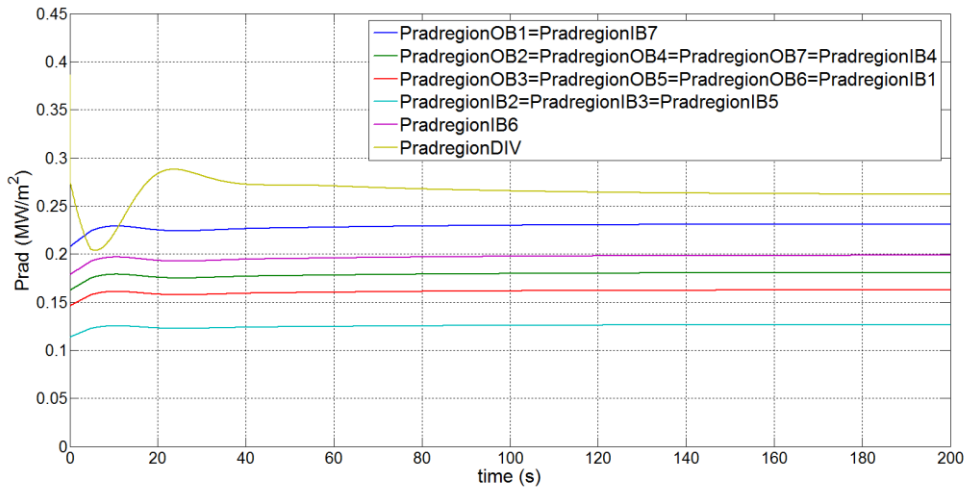


Figure 18: HCPB DEMO1 Auxiliary Heating sudden decrease x0.5 P<sub>rad</sub> graphic.

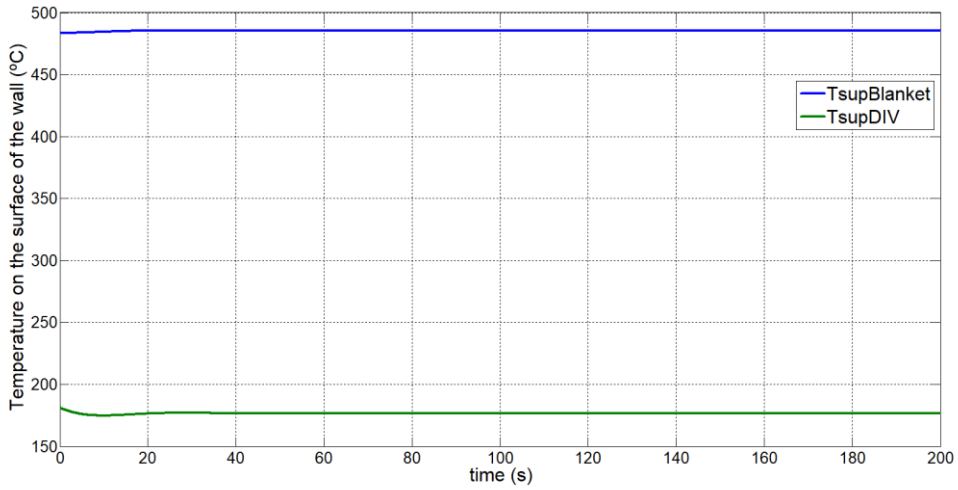


Figure 19: HCPB DEMO1 Auxiliary Heating sudden decrease x0.5 Temperature on the surface of the blanket and divertor wall graphic.

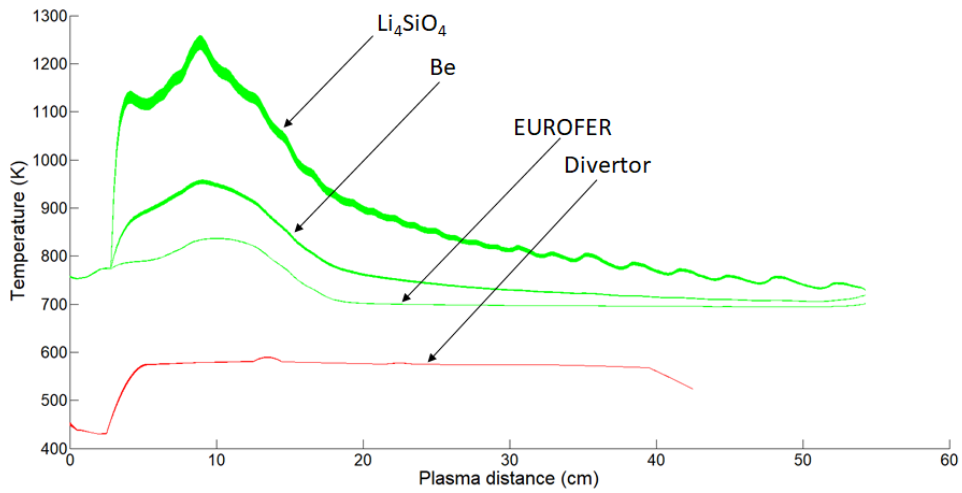


Figure 20: HCPB DEMO1 Auxiliary Heating sudden decrease x0.5 evolution of the BB and divertor temperature graphic.

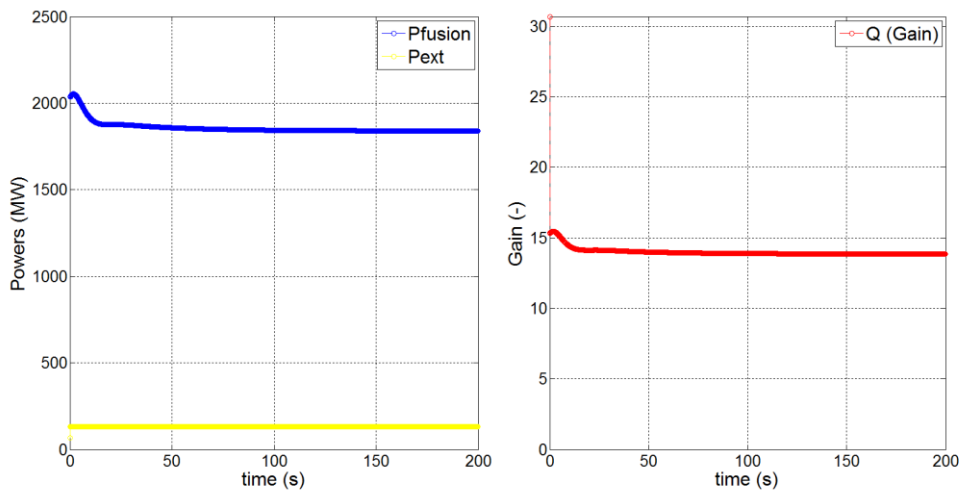


Figure 21: HCPB DEMO1 Auxiliary Heating sudden increase x2 P<sub>fus</sub> and gain graphic.



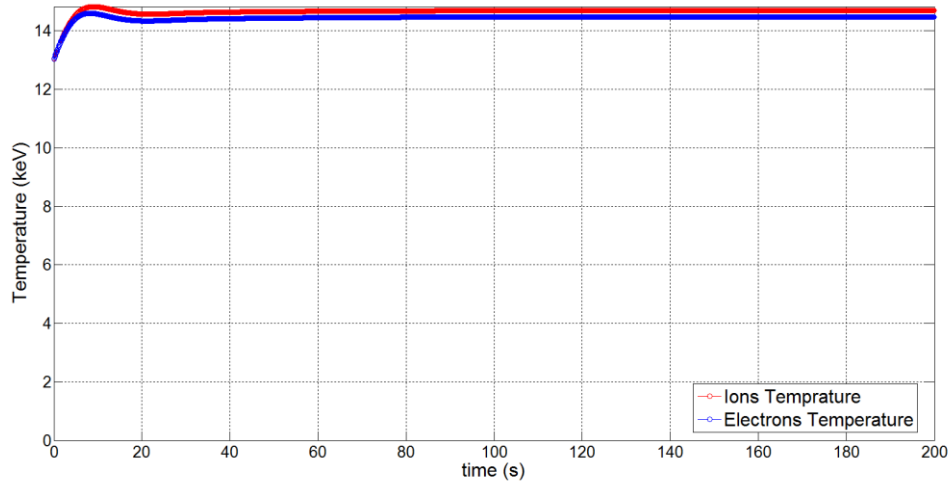


Figure 22: HCPB DEMO1 Auxiliary Heating sudden increase x2 Temperatures graphic.

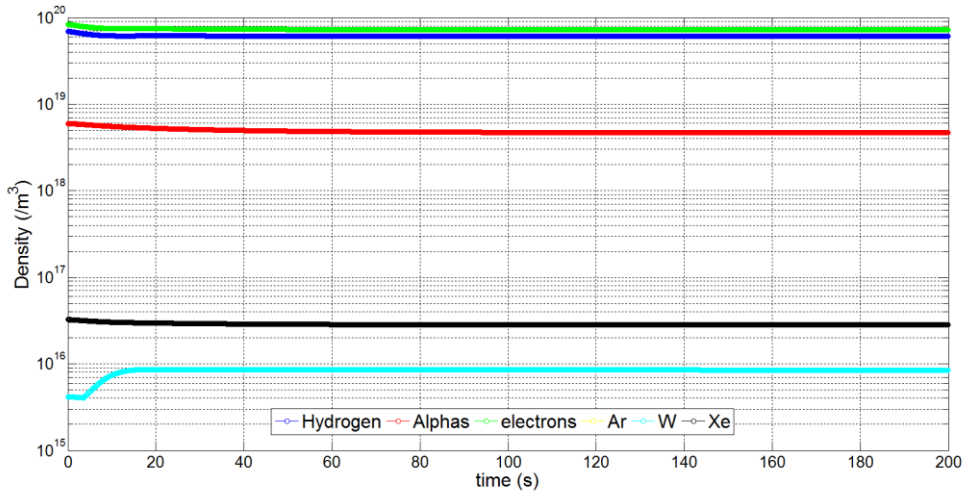


Figure 23: HCPB DEMO1 Auxiliary Heating sudden increase x2 Densities graphic.

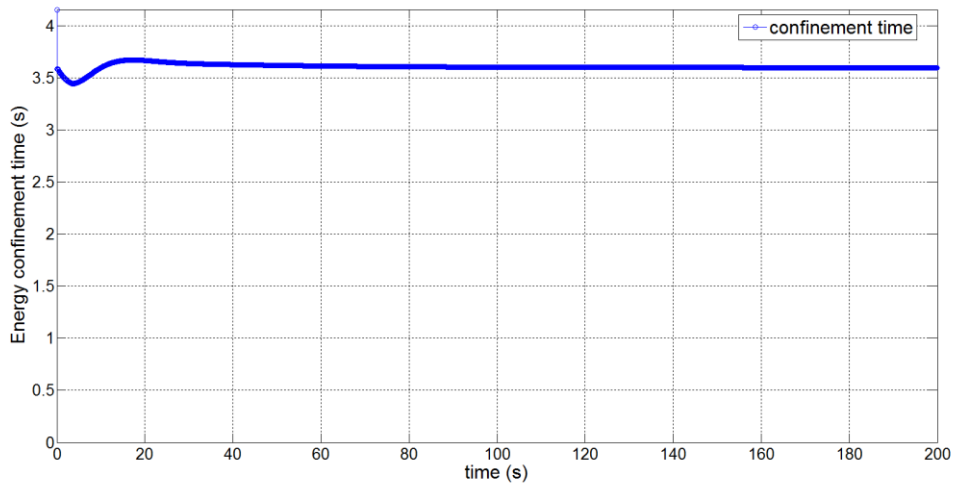


Figure 24: HCPB DEMO1 Auxiliary Heating sudden increase x2 Confinement time graphic.

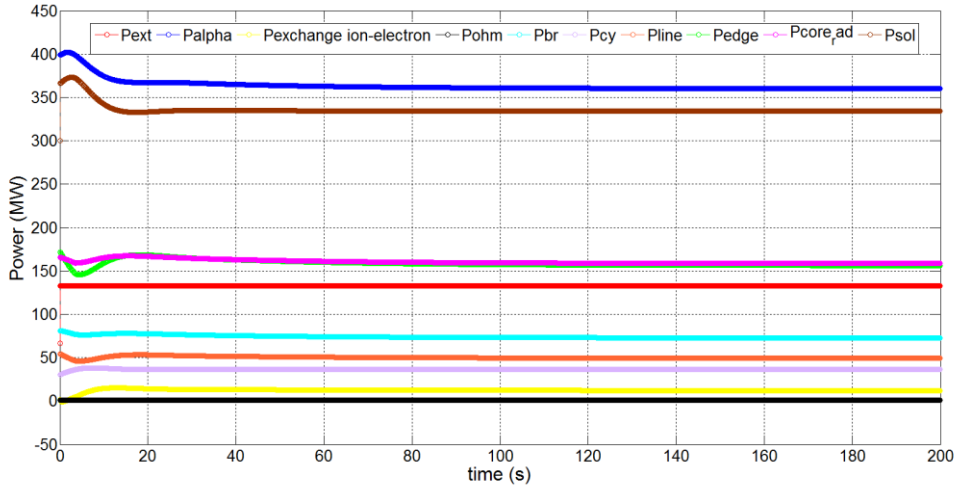


Figure 25: HCPB DEMO1 Auxiliary Heating sudden increase x2 Powers graphic.

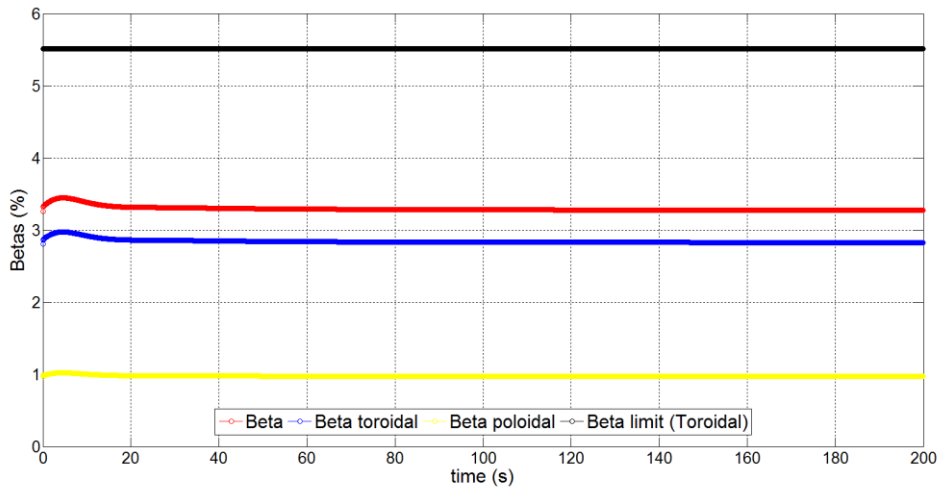


Figure 26: HCPB DEMO1 Auxiliary Heating sudden increase x2 Betas graphic.

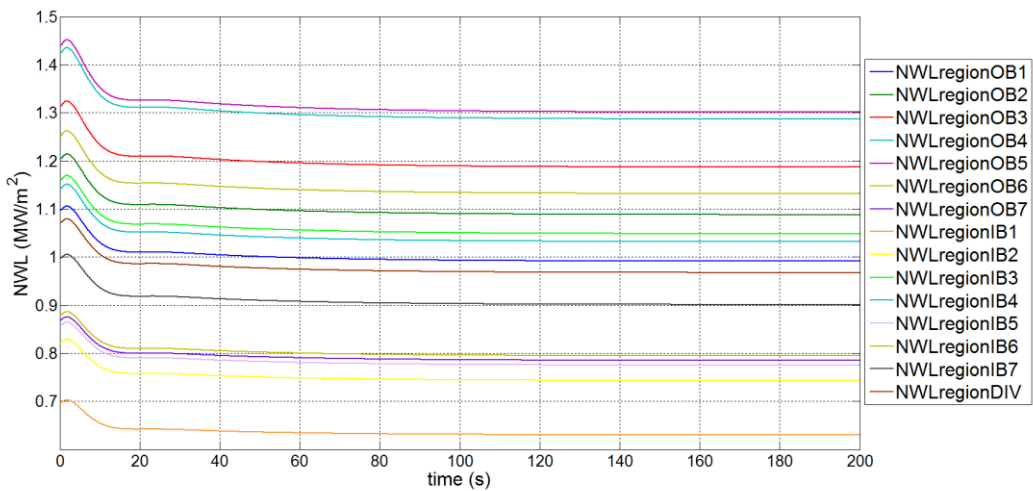


Figure 27: HCPB DEMO1 Auxiliary Heating sudden increase x2 NWL graphic.

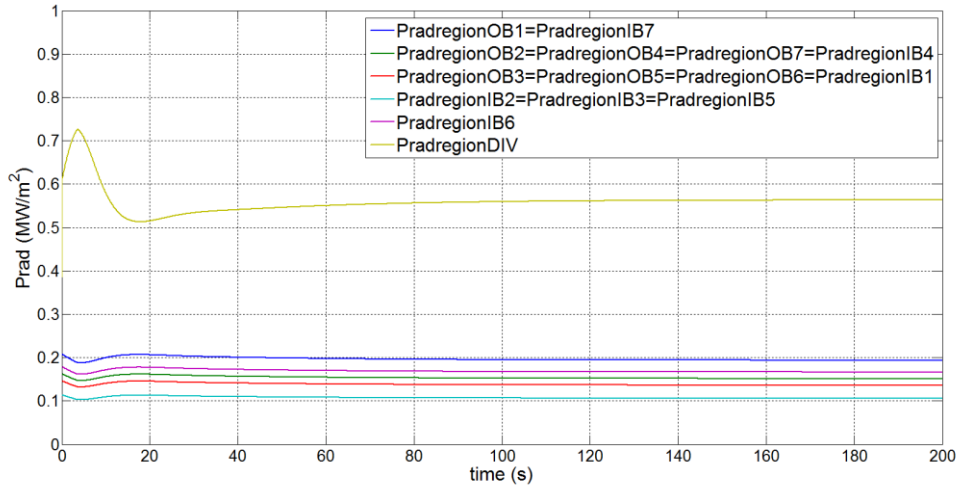


Figure 28: HCPB DEMO1 Auxiliary Heating sudden increase x2  $P_{rad}$  graphic.

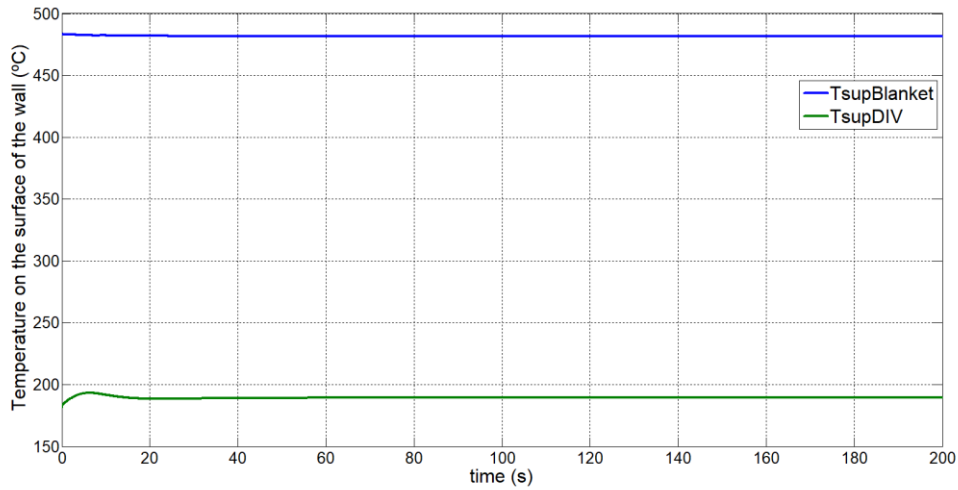


Figure 29: HCPB DEMO1 Auxiliary Heating sudden increase x2 Temperature on the surface of the blanket and divertor wall graphic.

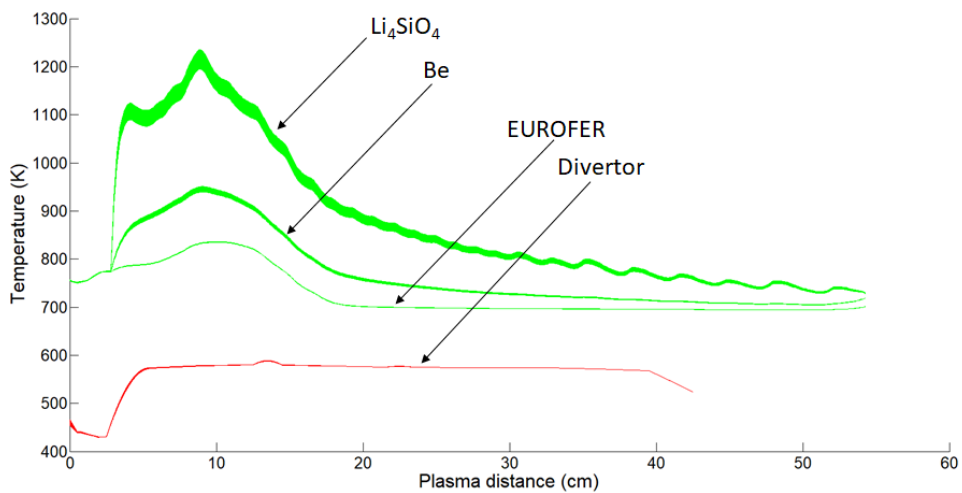


Figure 30: HCPB DEMO1 Auxiliary Heating sudden increase x2 evolution of the BB and divertor temperature graphic.

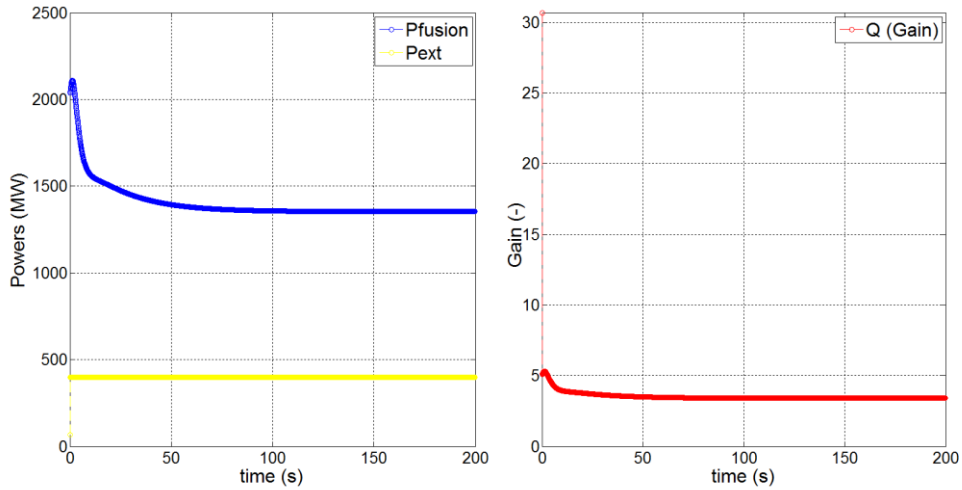


Figure 31: HCPB DEMO1 Auxiliary Heating sudden increase x6  $P_{fus}$  and gain graphic.

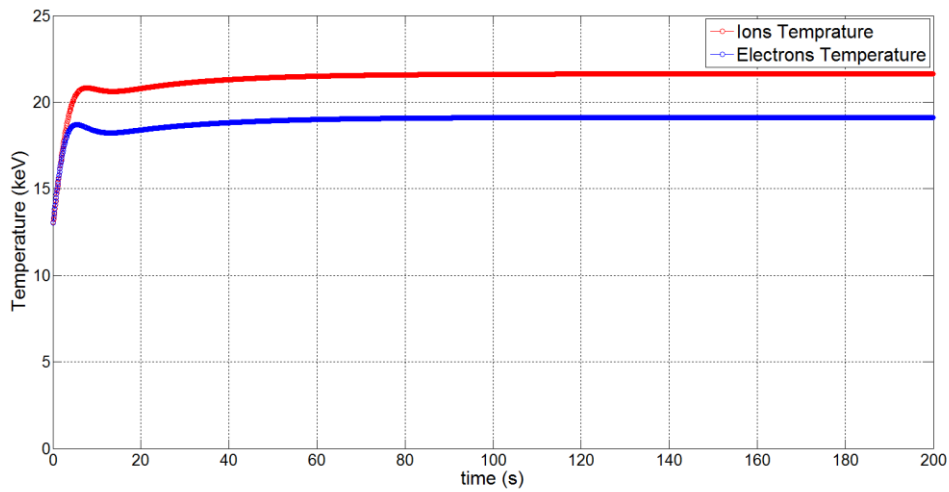


Figure 32: HCPB DEMO1 Auxiliary Heating sudden increase x6 Temperatures graphic.

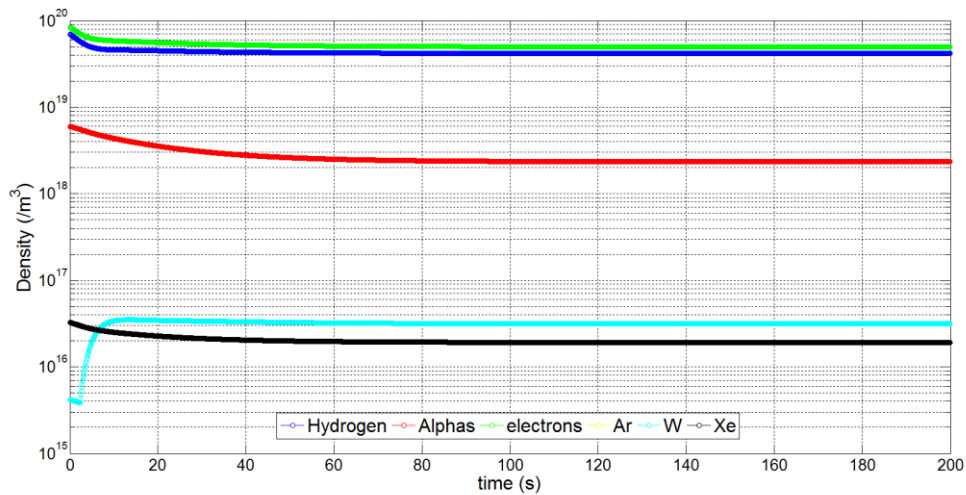


Figure 33: HCPB DEMO1 Auxiliary Heating sudden increase x6 Densities graphic.

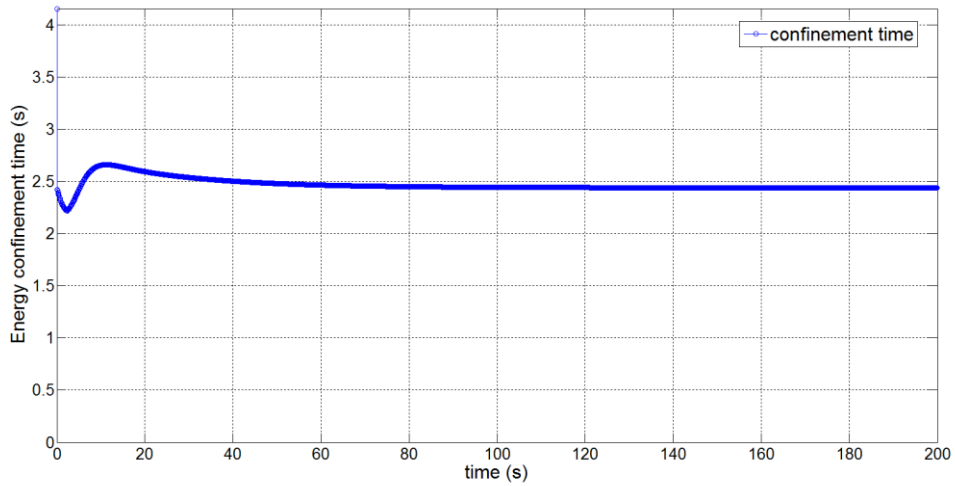


Figure 34: HCPB DEMO1 Auxiliary Heating sudden increase x6 Confinement time graphic.

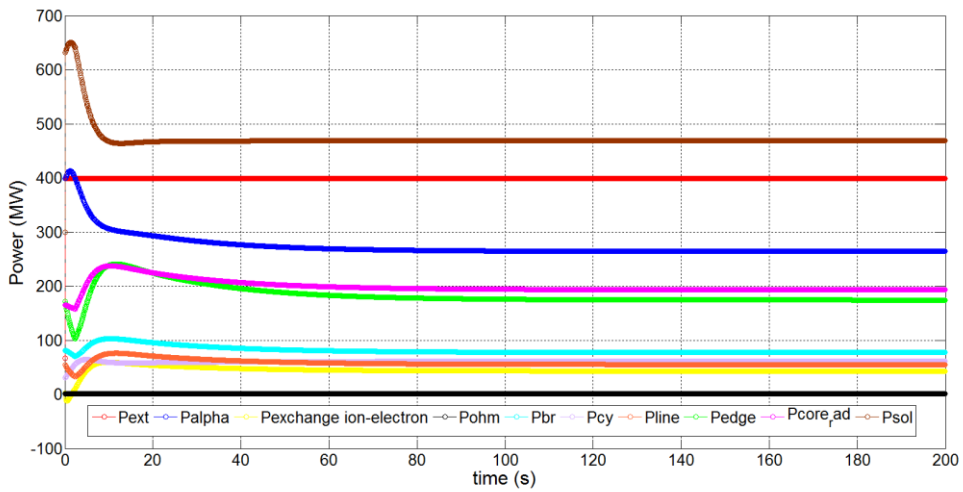


Figure 35: HCPB DEMO1 Auxiliary Heating sudden increase x6 Powers graphic.

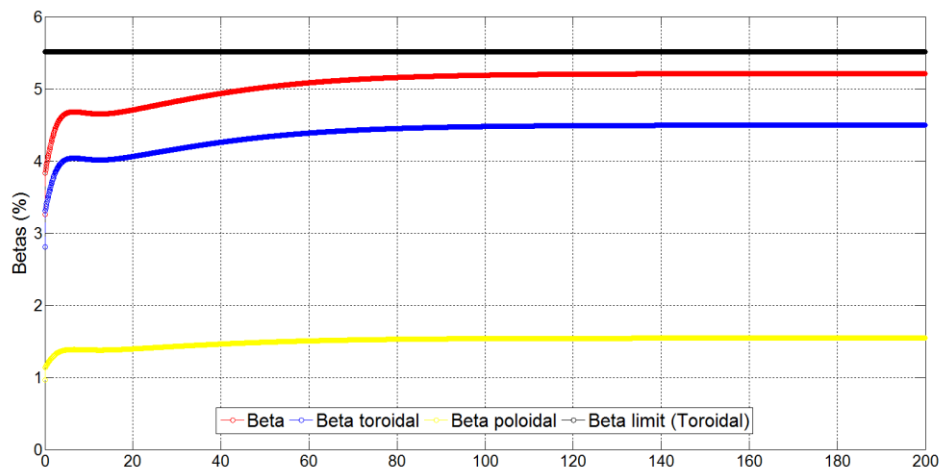


Figure 36: HCPB DEMO1 Auxiliary Heating sudden increase x6 Betas graphic.

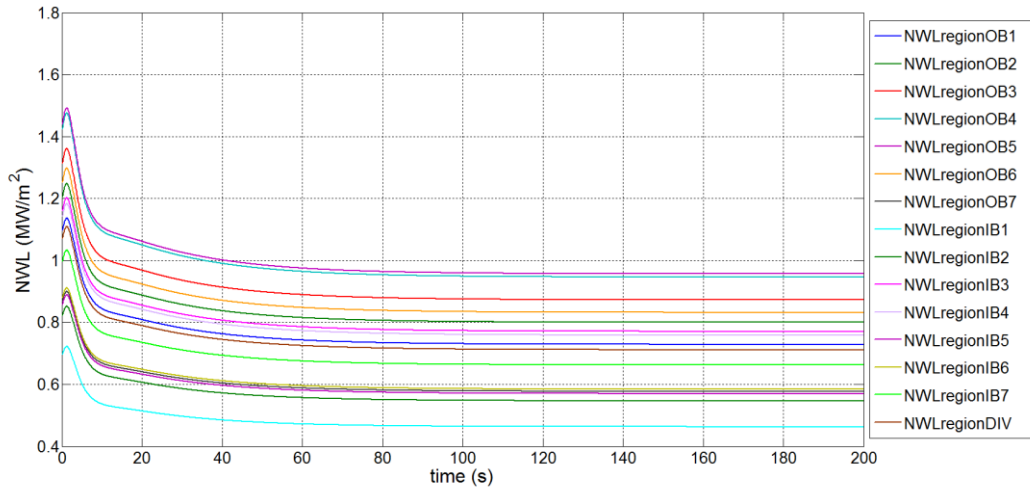


Figure 37: HCPB DEMO1 Auxiliary Heating sudden increase x6 NWL graphic.

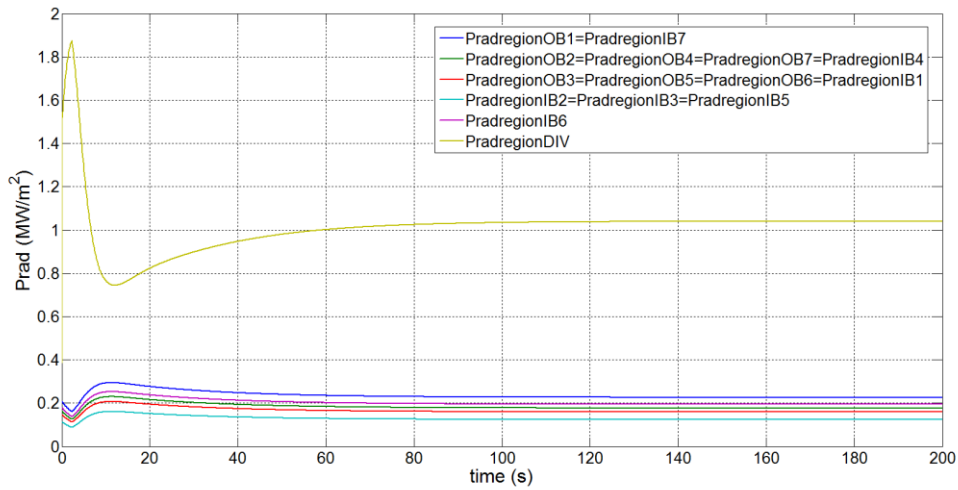


Figure 38: HCPB DEMO1 Auxiliary Heating sudden increase x6  $P_{rad}$  graphic.

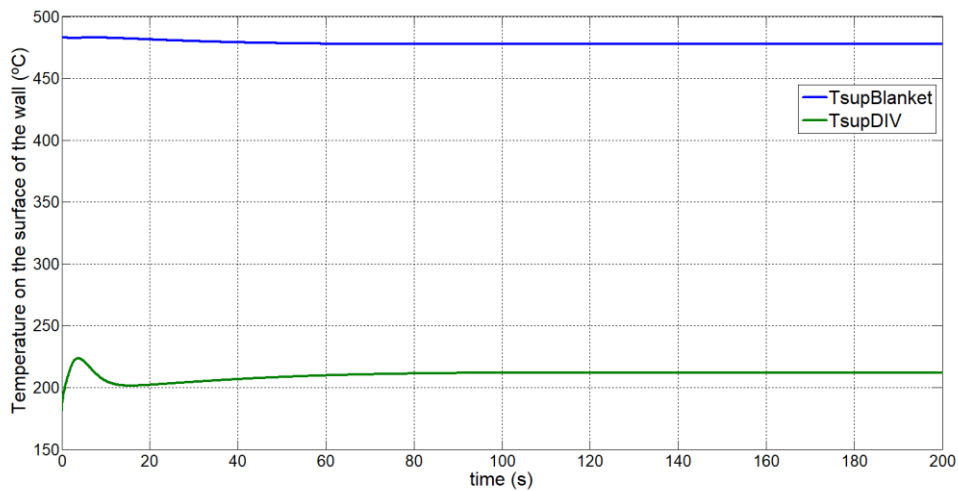


Figure 39: HCPB DEMO1 Auxiliary Heating sudden increase x6 Temperature on the surface of the blanket and divertor wall graphic.

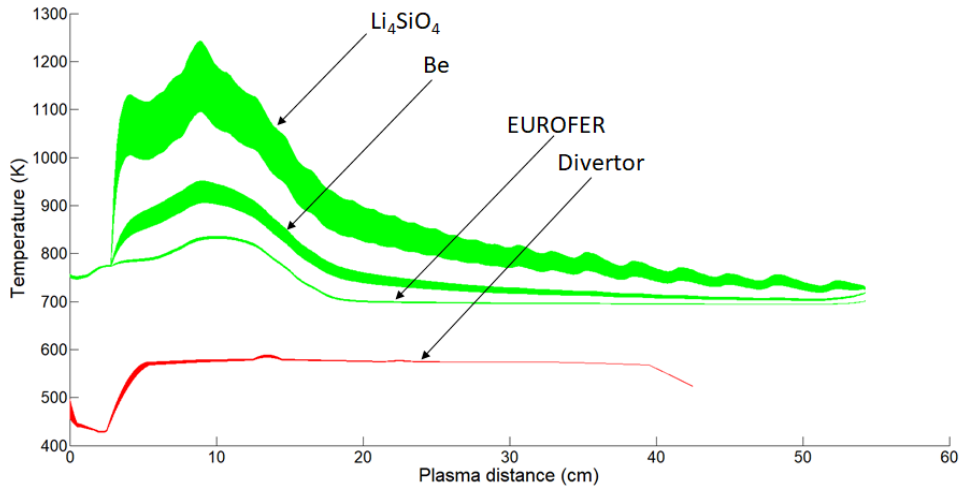


Figure 40: HCPB DEMO1 Auxiliary Heating sudden increase x6 evolution of the BB and divertor temperature graphic.

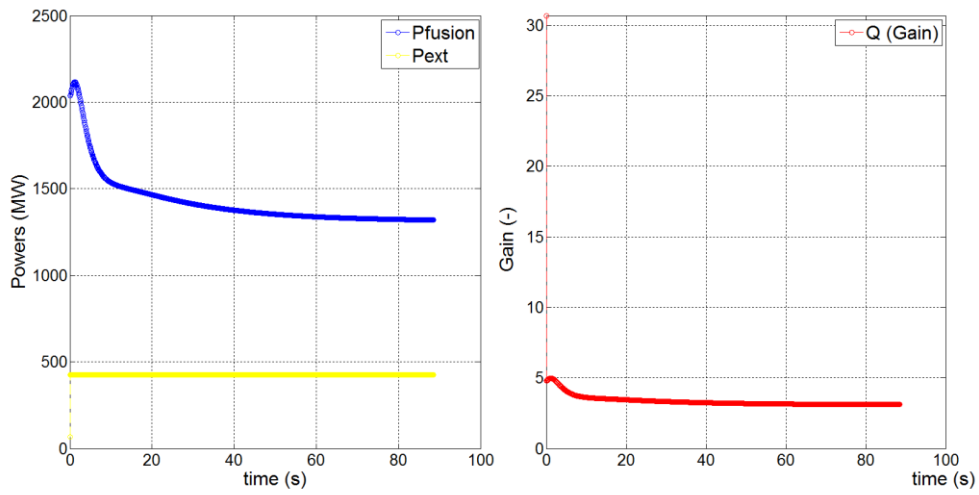


Figure 41: HCPB DEMO1 Auxiliary Heating sudden increase x6.4  $P_{fus}$  and gain graphic.

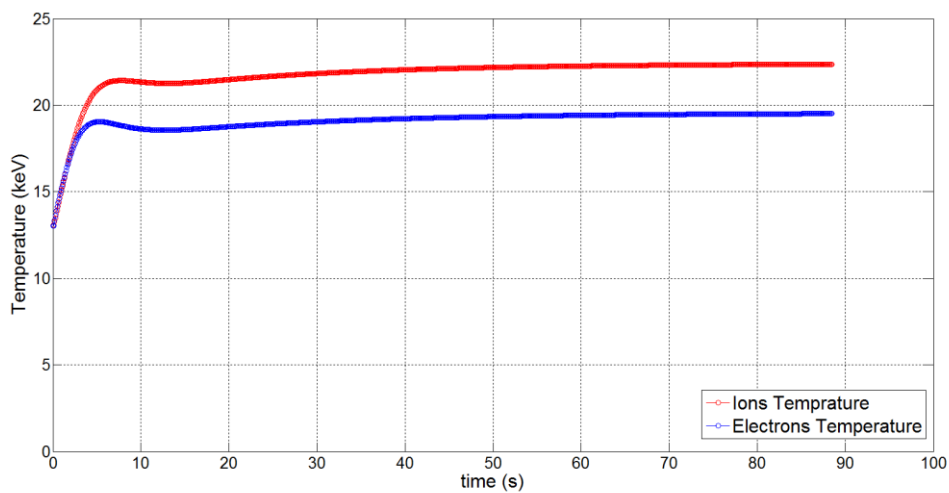


Figure 42: HCPB DEMO1 Auxiliary Heating sudden increase x6.4 Temperatures graphic.

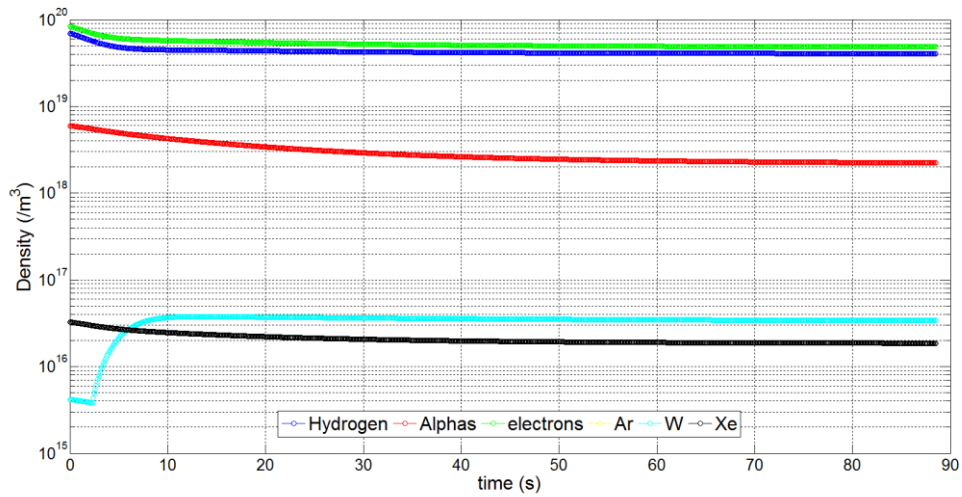


Figure 43: HCPB DEMO1 Auxiliary Heating sudden increase x6.4 Densities graphic.

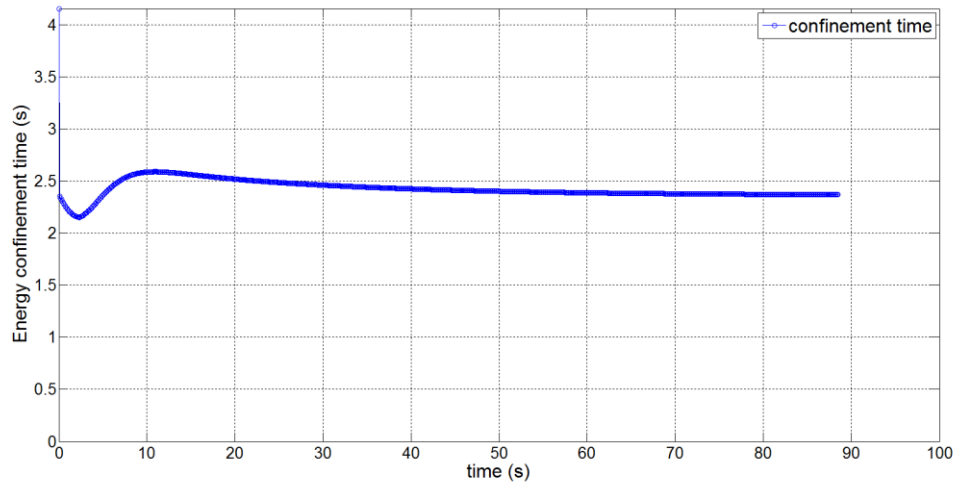


Figure 44: HCPB DEMO1 Auxiliary Heating sudden increase x6.4 Confinement time graphic.

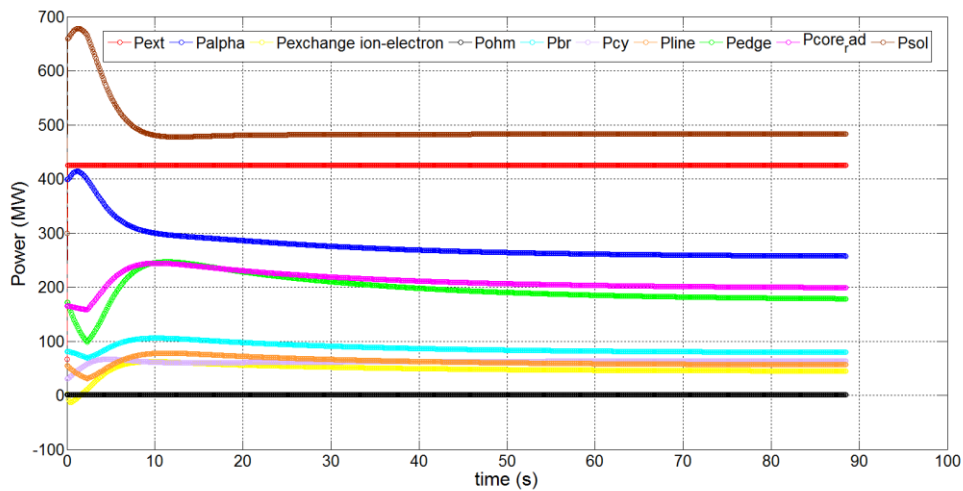


Figure 45: HCPB DEMO1 Auxiliary Heating sudden increase x6.4 Powers graphic.



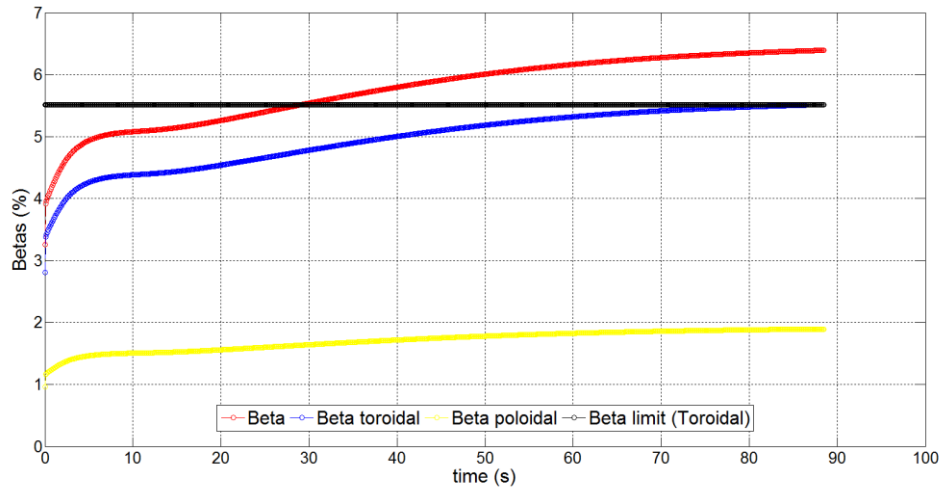


Figure 46: HCPB DEMO1 Auxiliary Heating sudden increase x6.4 Betas graphic.

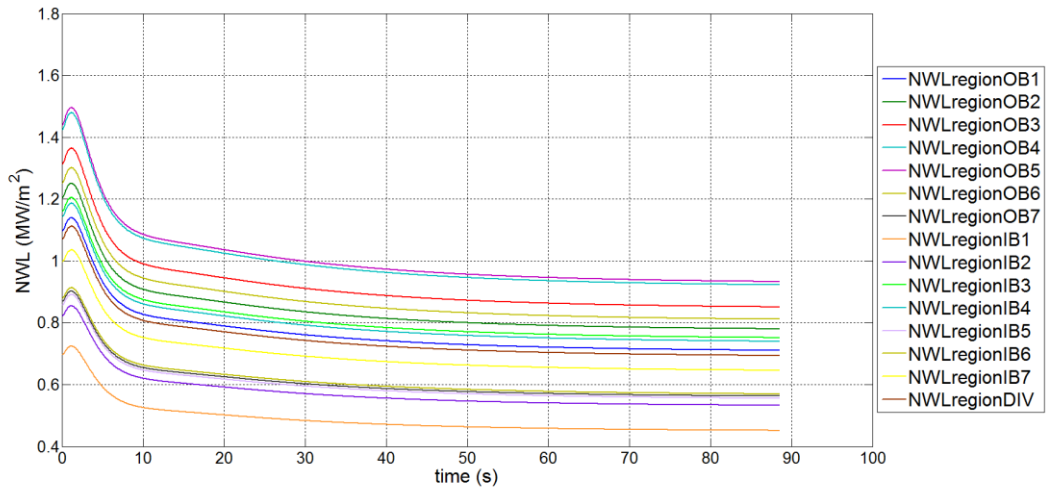


Figure 47: HCPB DEMO1 Auxiliary Heating sudden increase x6.4 NWL graphic.

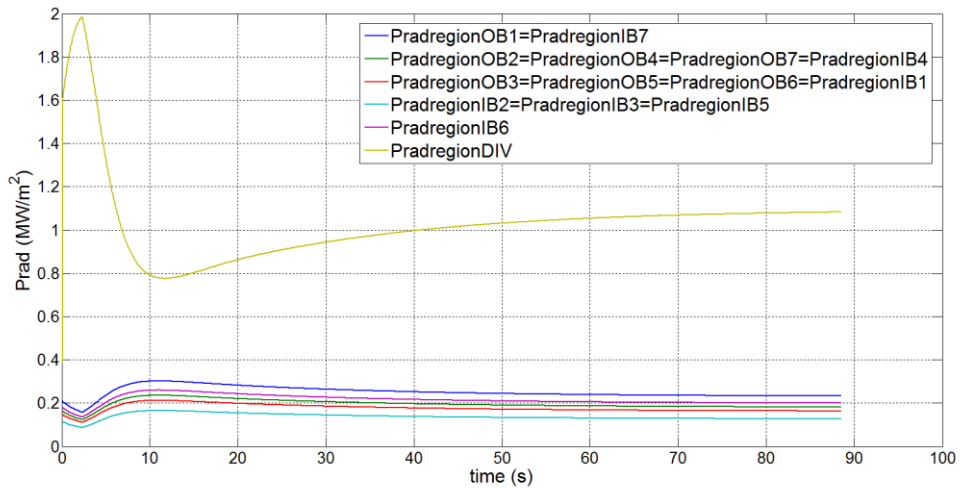


Figure 48: HCPB DEMO1 Auxiliary Heating sudden increase x6.4  $P_{rad}$  graphic.

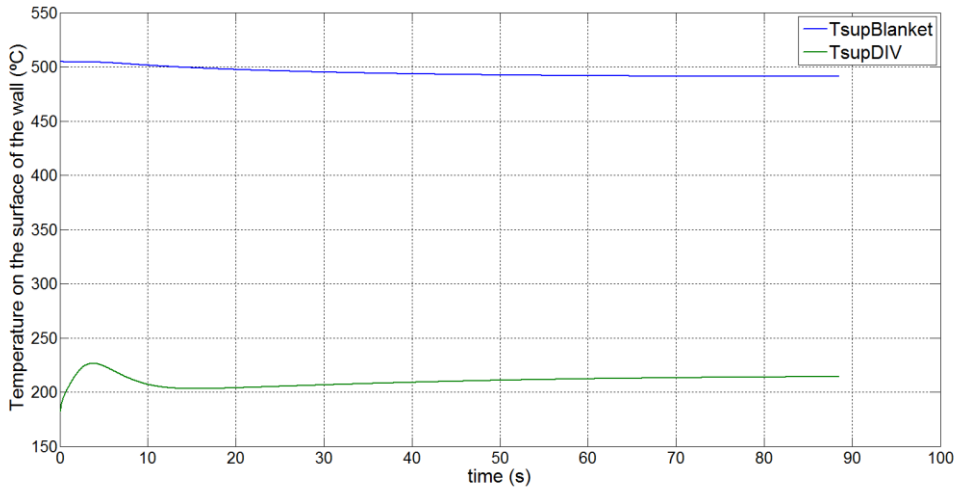


Figure 49: HCPB DEMO1 Auxiliary Heating sudden increase x6.4 Temperature on the surface of the blanket and divertor wall graphic.

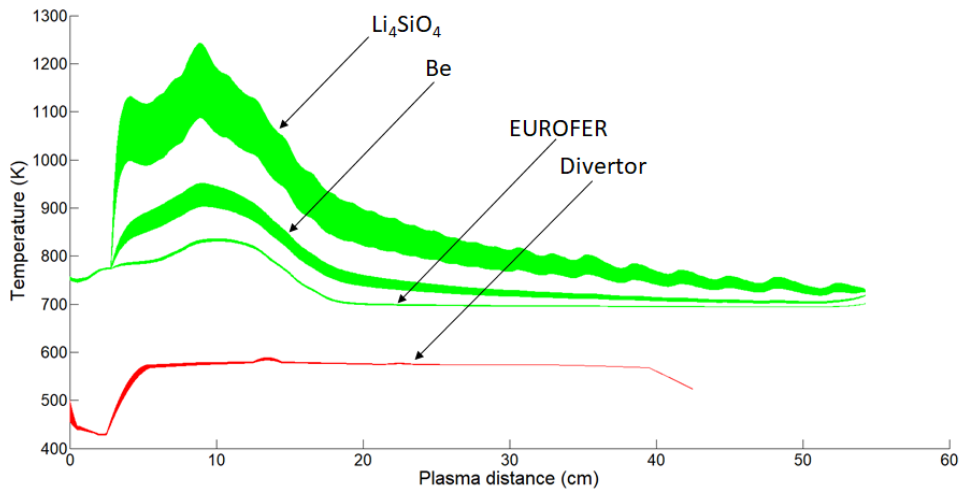


Figure 50: HCPB DEMO1 Auxiliary Heating sudden increase x6.4 evolution of the BB and divertor temperature graphic.

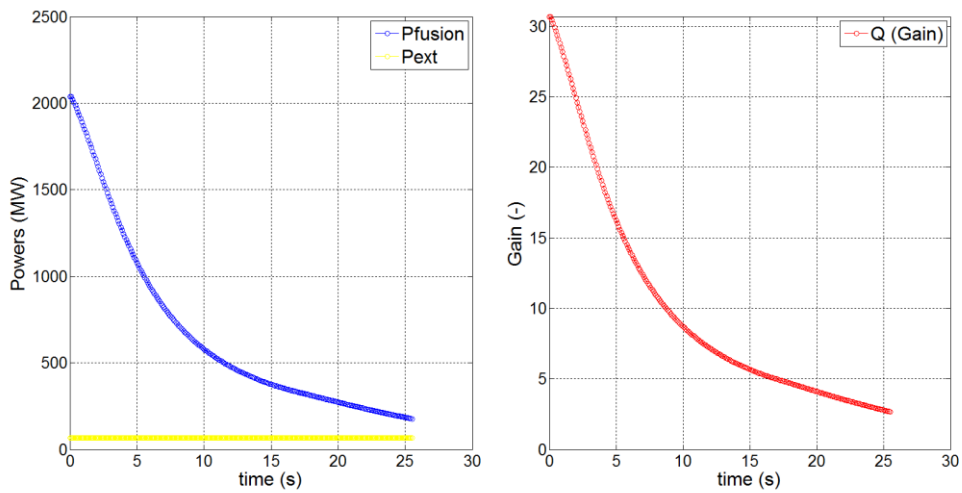


Figure 51: HCPB DEMO1 Fueling Rate Cut-off P<sub>fus</sub> and gain graphic.

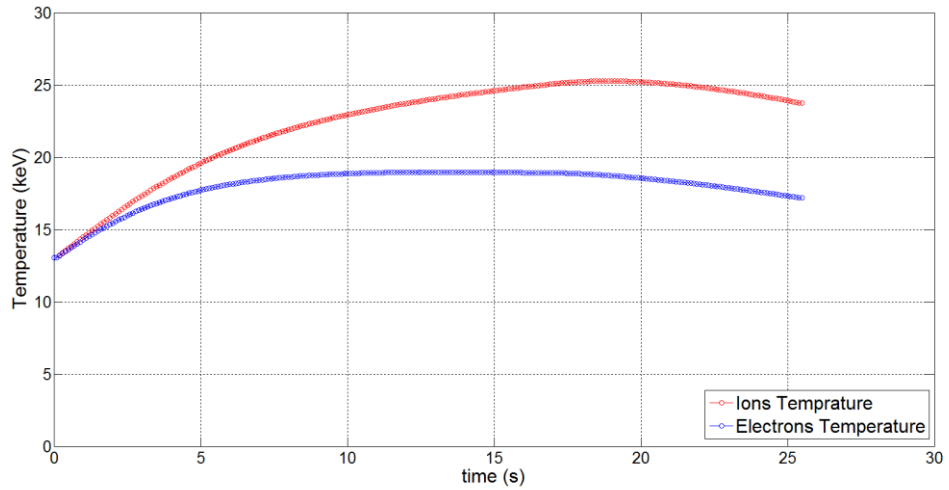


Figure 52: HCPB DEMO1 Fueling Rate Cut-off Temperatures graphic.

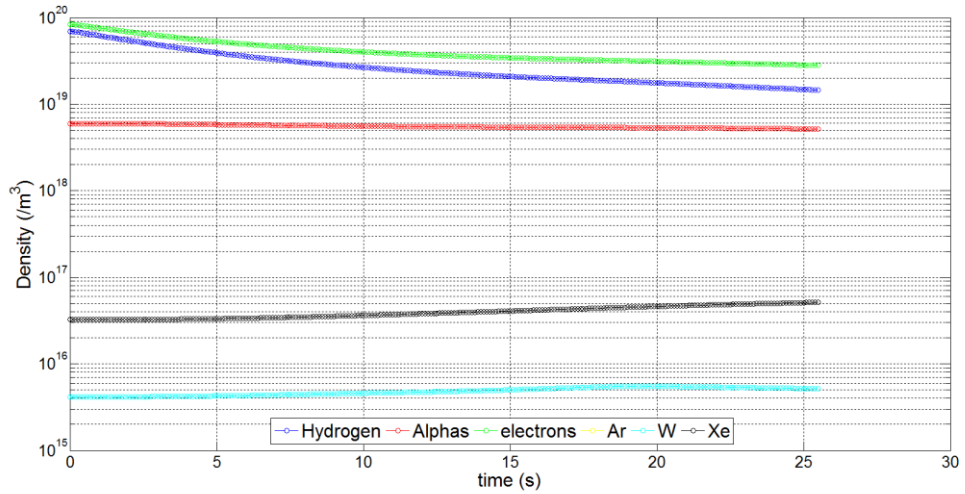


Figure 53: HCPB DEMO1 Fueling Rate Cut-off Densities graphic.

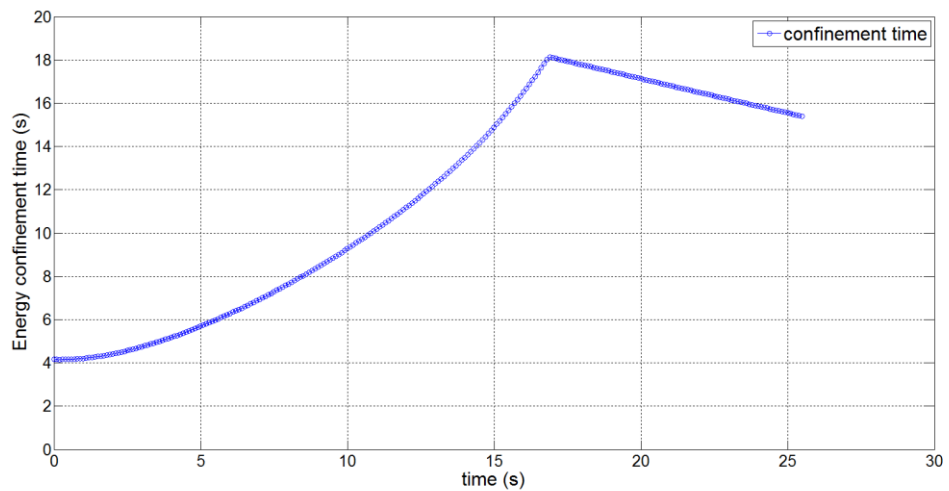


Figure 54: HCPB DEMO1 Fueling Rate Cut-off Confinement time graphic.

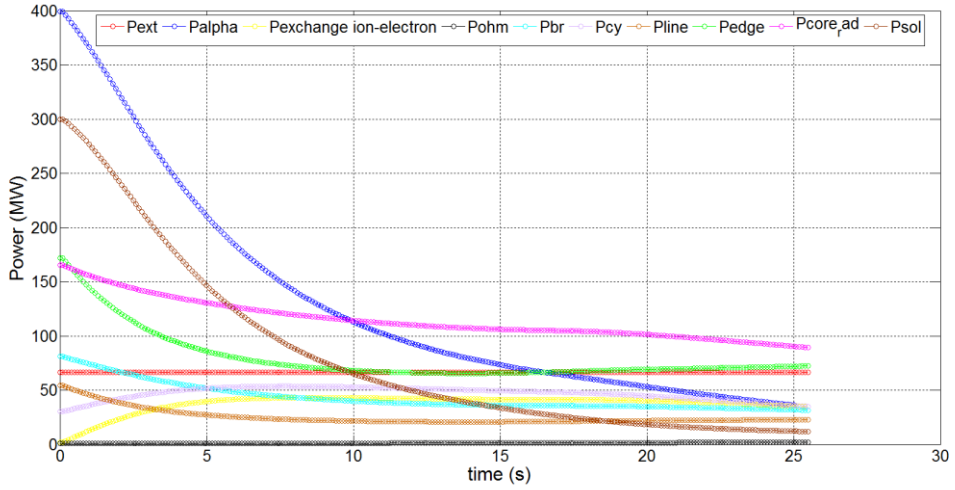


Figure 55: HCPB DEMO1 Fueling Rate Cut-off Powers graphic.

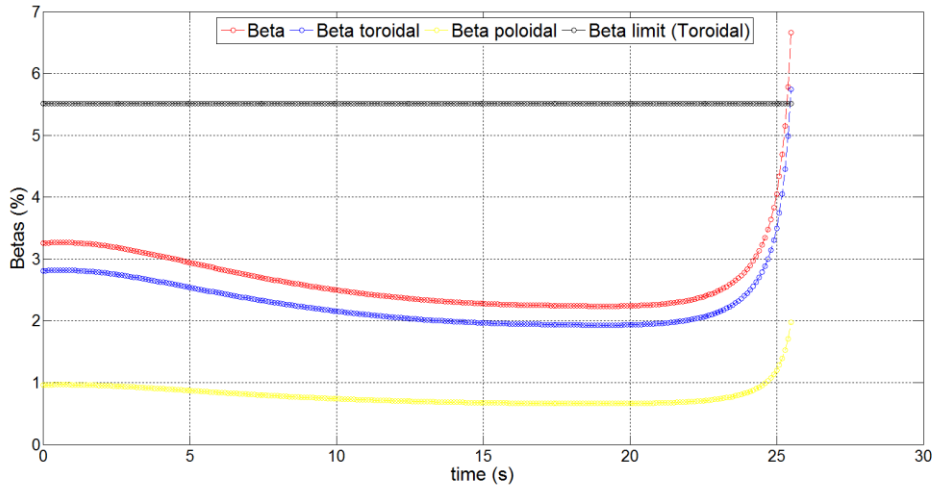


Figure 56: HCPB DEMO1 Fueling Rate Cut-off Betas graphic.

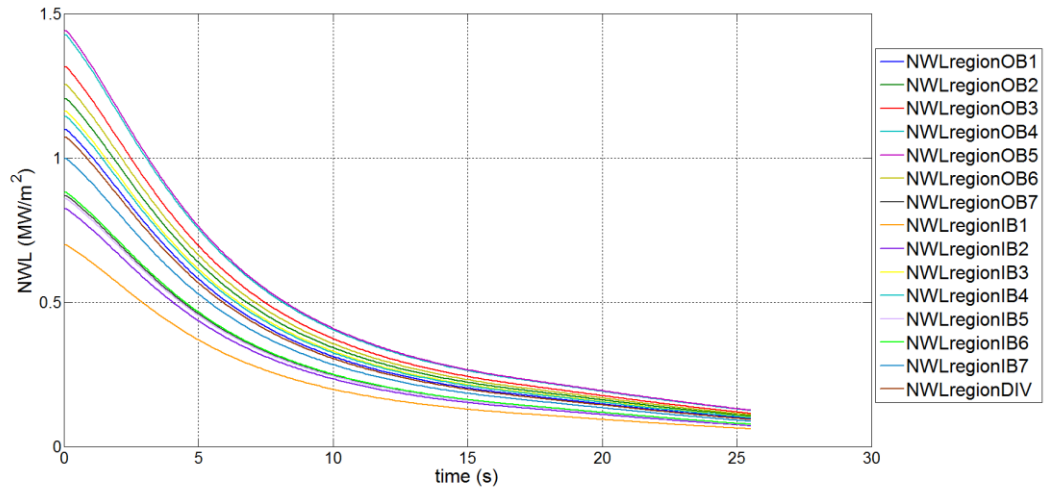


Figure 57: HCPB DEMO1 Fueling Rate Cut-off NWL graphic.

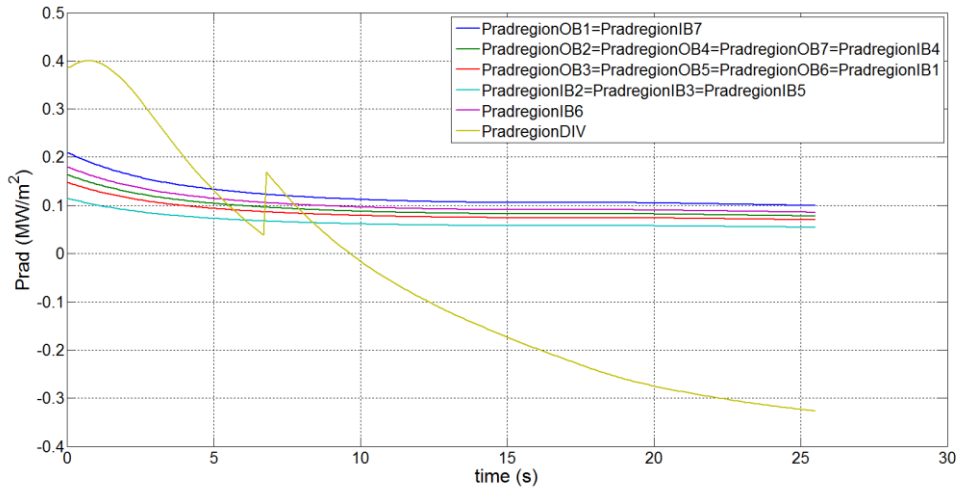


Figure 58: HCPB DEMO1 Fueling Rate Cut-off  $P_{rad}$  graphic.

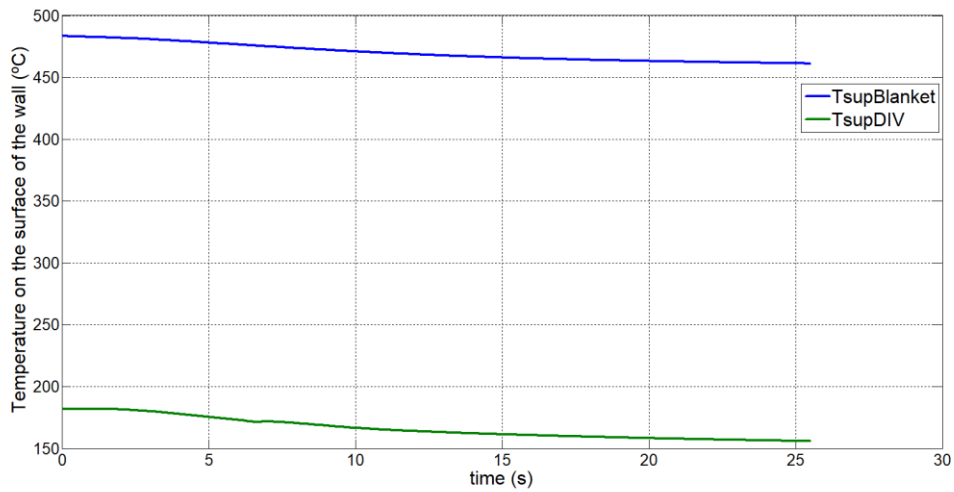


Figure 59: HCPB DEMO1 Fueling Rate Cut-off Temperature on the surface of the blanket and divertor wall graphic.

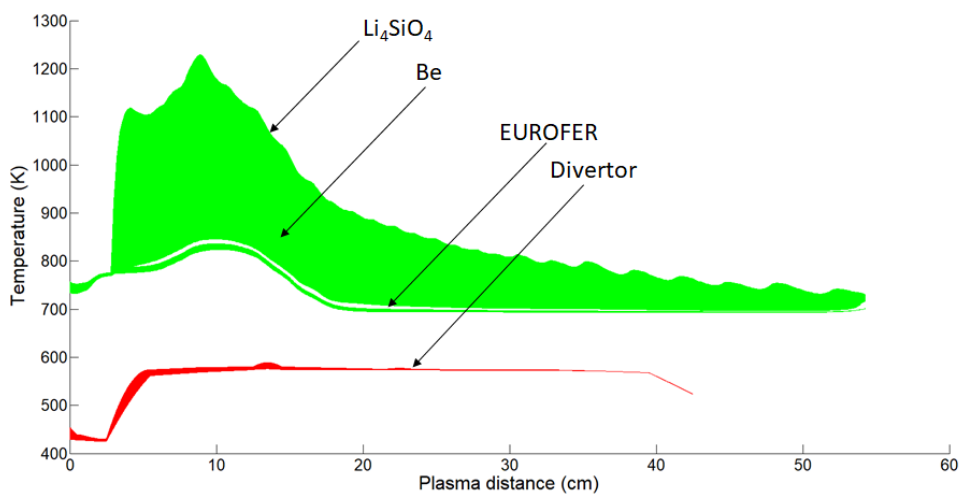


Figure 60: HCPB DEMO1 Fueling Rate Cut-off evolution of the BB and divertor temperature graphic.

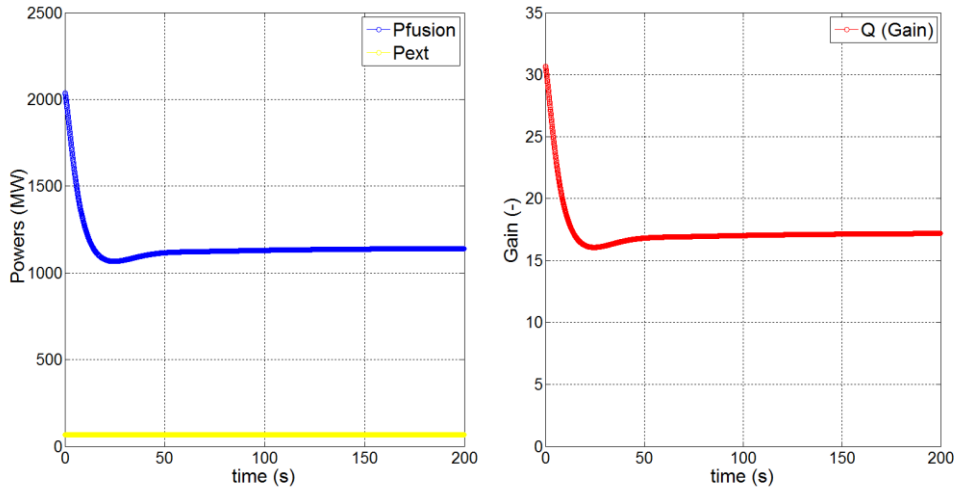


Figure 61: HCPB DEMO1 Fueling Rate sudden decrease x0.5  $P_{fus}$  and gain graphic.

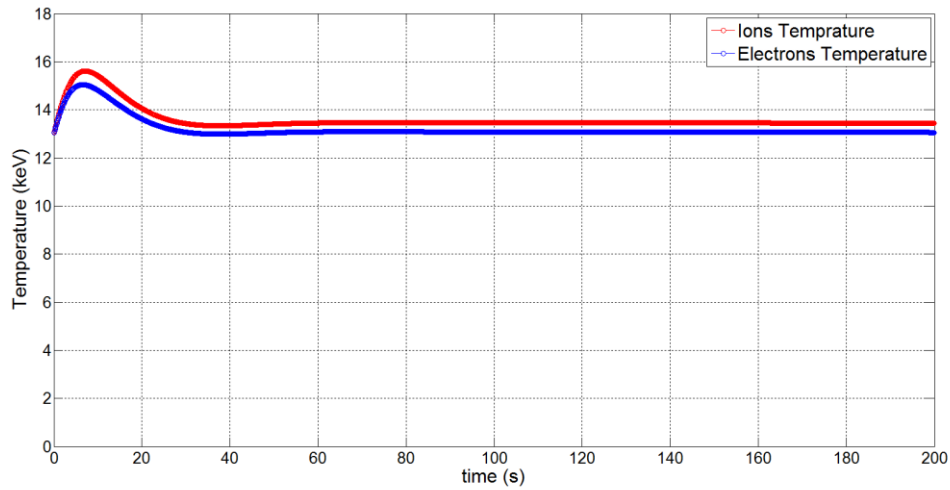


Figure 62: HCPB DEMO1 Fueling Rate sudden decrease x0.5 Temperatures graphic.

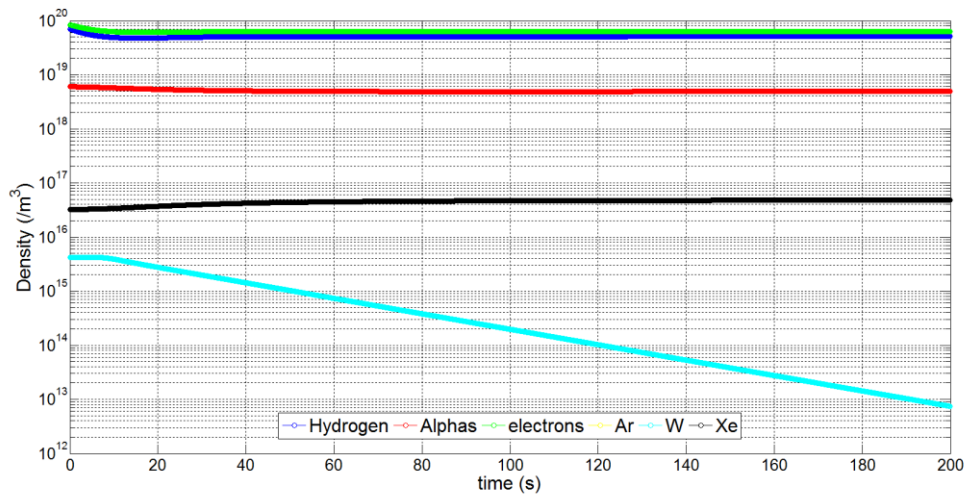


Figure 63: HCPB DEMO1 Fueling Rate sudden decrease x0.5 Densities graphic.

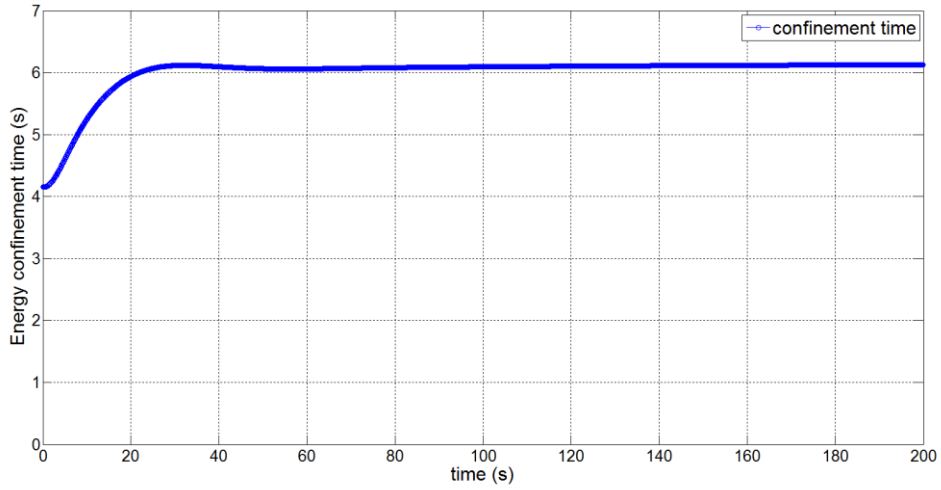


Figure 64: HCPB DEMO1 Fueling Rate sudden decrease x0.5 Confinement time graphic.

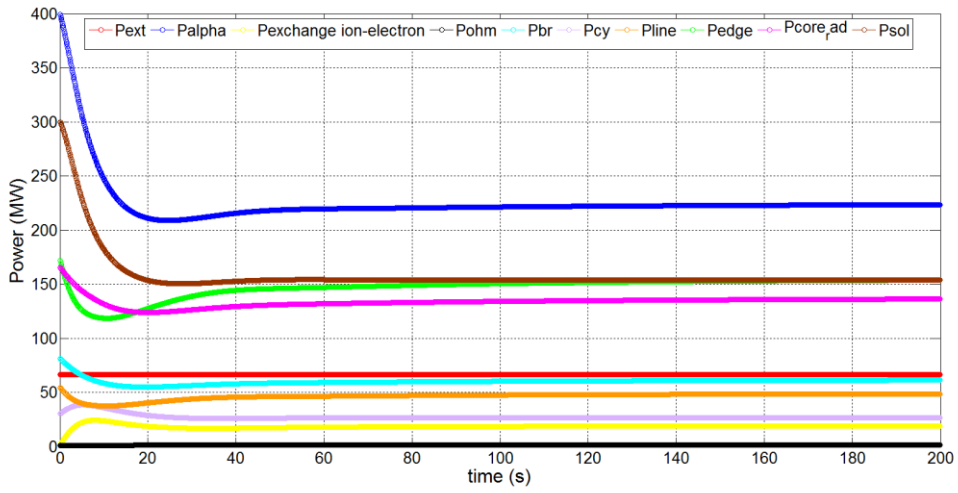


Figure 65: HCPB DEMO1 Fueling Rate sudden decrease x0.5 Powers graphic.

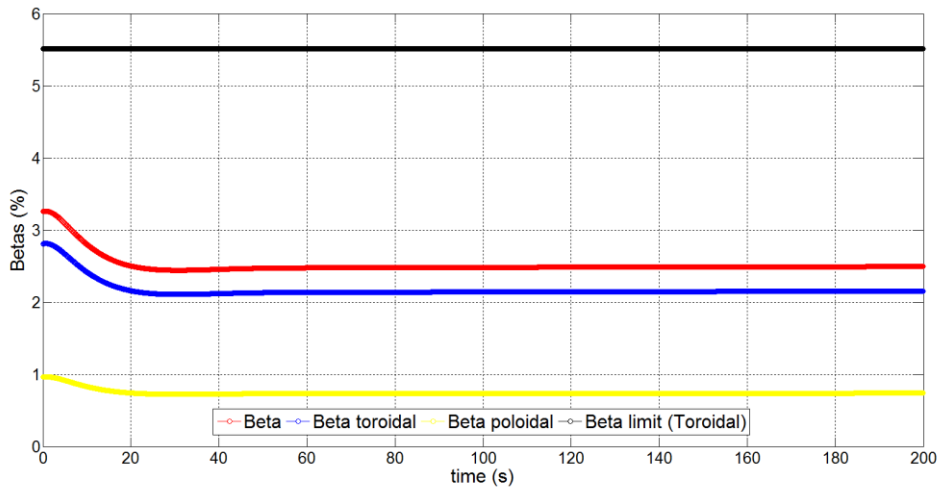


Figure 66: HCPB DEMO1 Fueling Rate sudden decrease x0.5 Betas graphic.

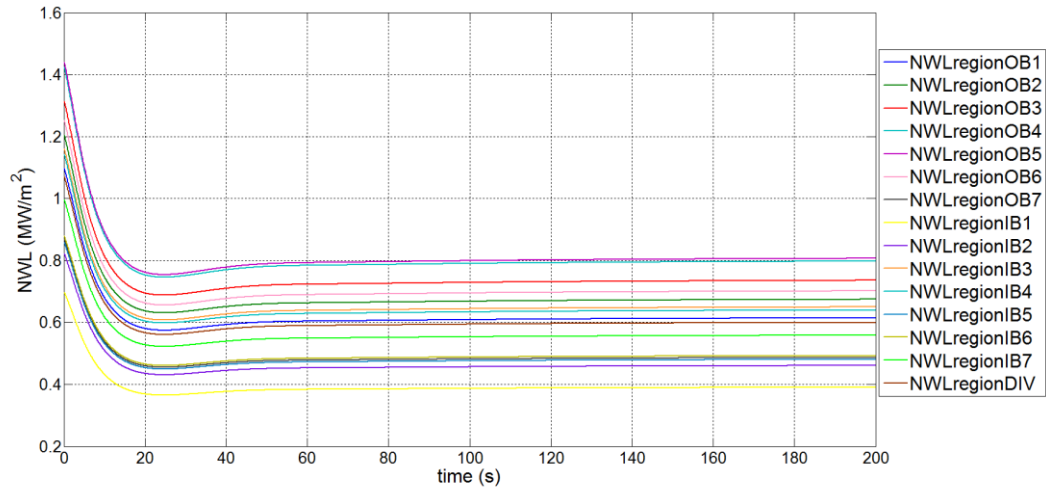


Figure 67: HCPB DEMO1 Fueling Rate sudden decrease x0.5 NWL graphic.

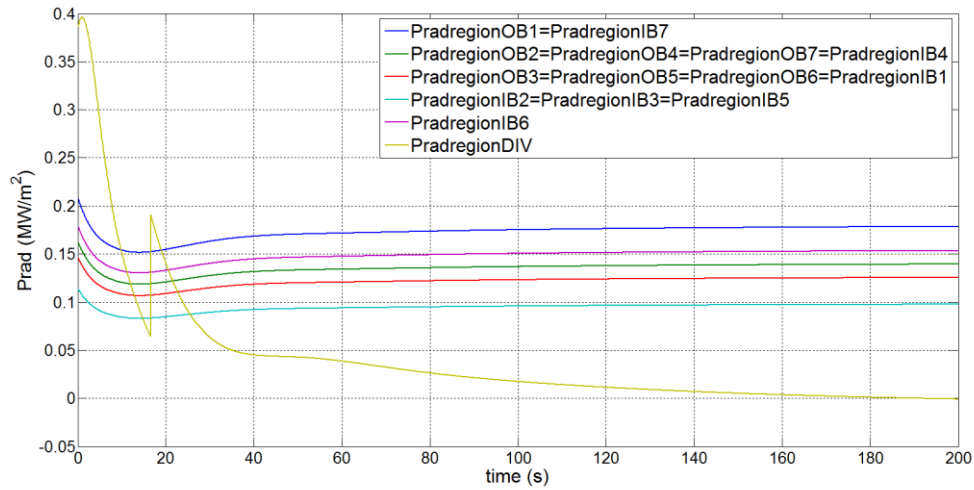


Figure 68: HCPB DEMO1 Fueling Rate sudden decrease x0.5  $P_{rad}$  graphic.

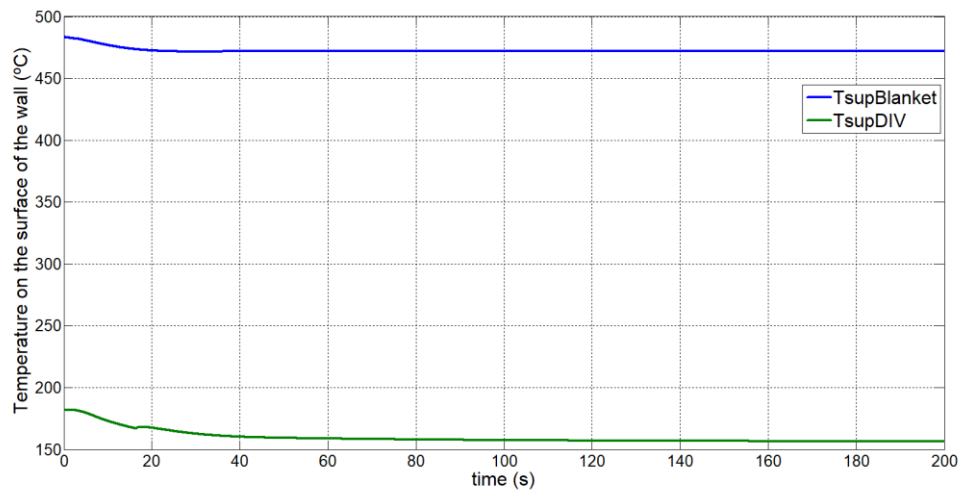


Figure 69: HCPB DEMO1 Fueling Rate sudden decrease x0.5 Temperature on the surface of the blanket and divertor wall graphic.



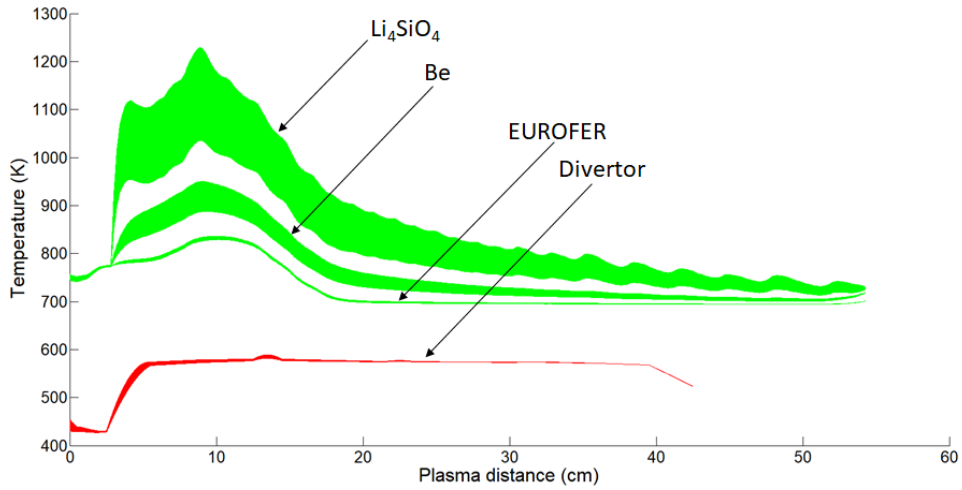


Figure 70: HCPB DEMO1 Fueling Rate sudden decrease x0.5 evolution of the BB and divertor temperature graphic.

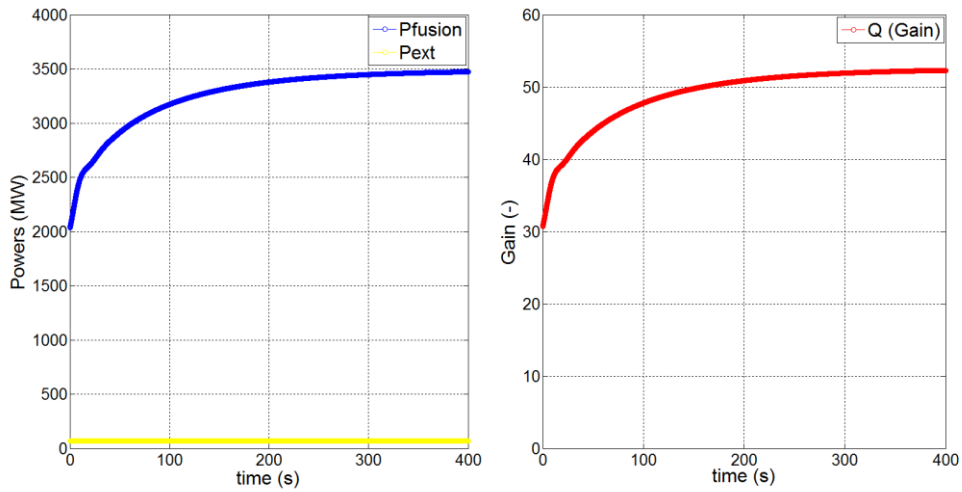


Figure 71: HCPB DEMO1 Fueling Rate sudden increase x1.25  $P_{fus}$  and gain graphic.

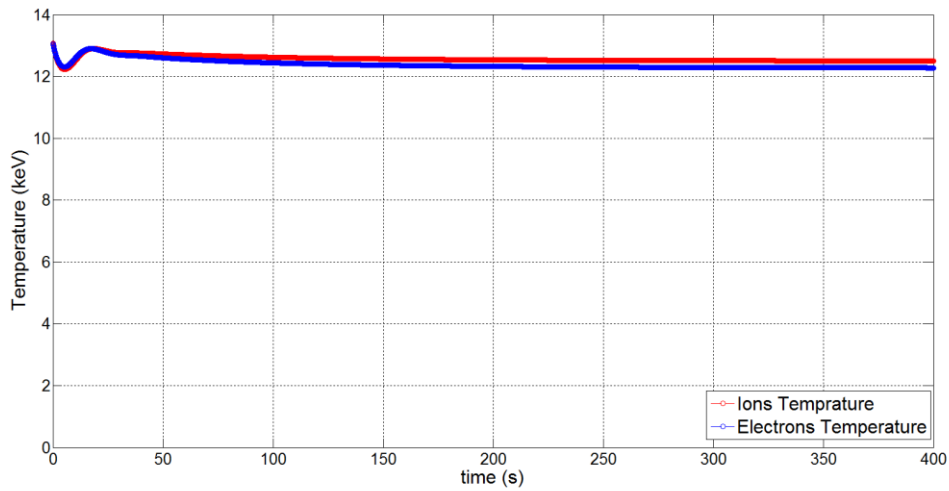


Figure 72: HCPB DEMO1 Fueling Rate sudden increase x1.25 Temperatures graphic.

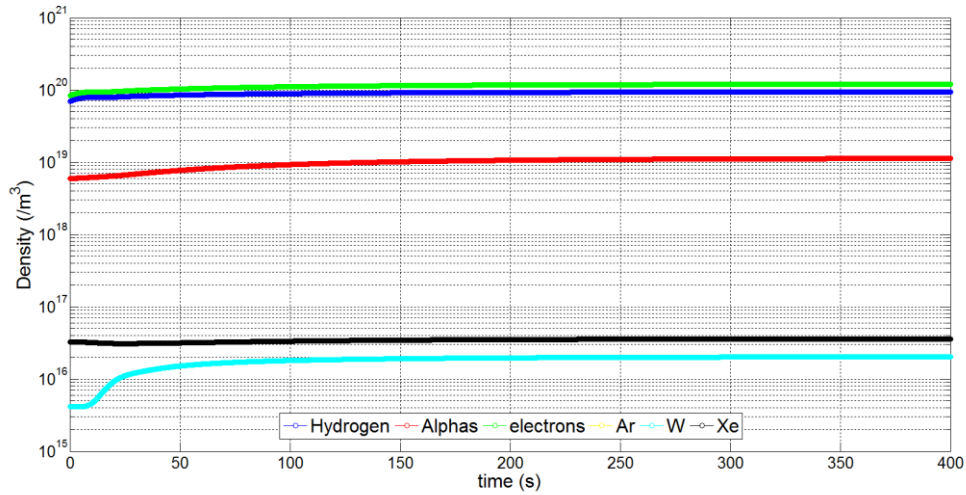


Figure 73: HCPB DEMO1 Fueling Rate sudden increase x1.25 Densities graphic.

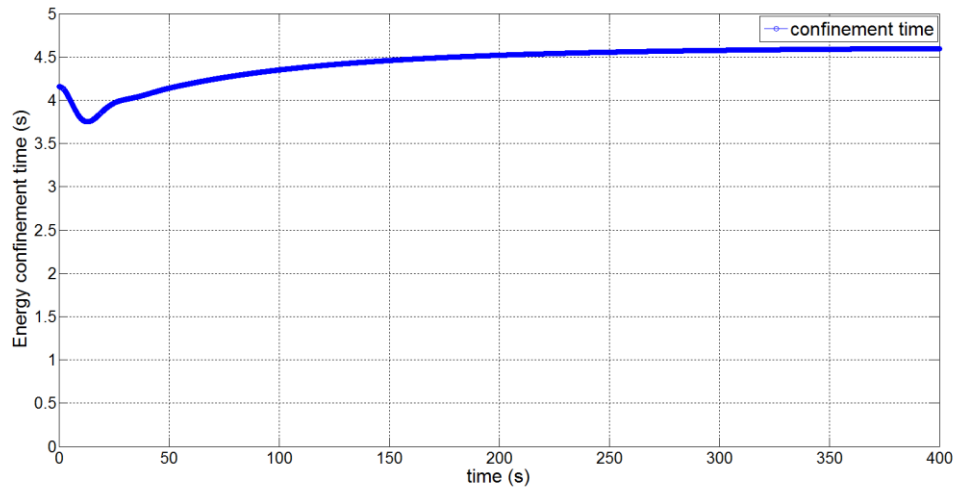


Figure 74: HCPB DEMO1 Fueling Rate sudden increase x1.25 Confinement time graphic.

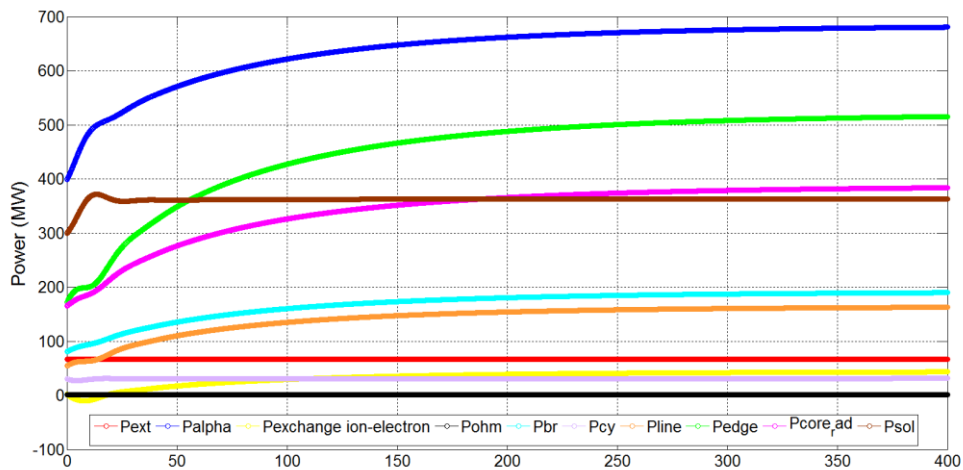


Figure 75: HCPB DEMO1 Fueling Rate sudden increase x1.25 Powers graphic.

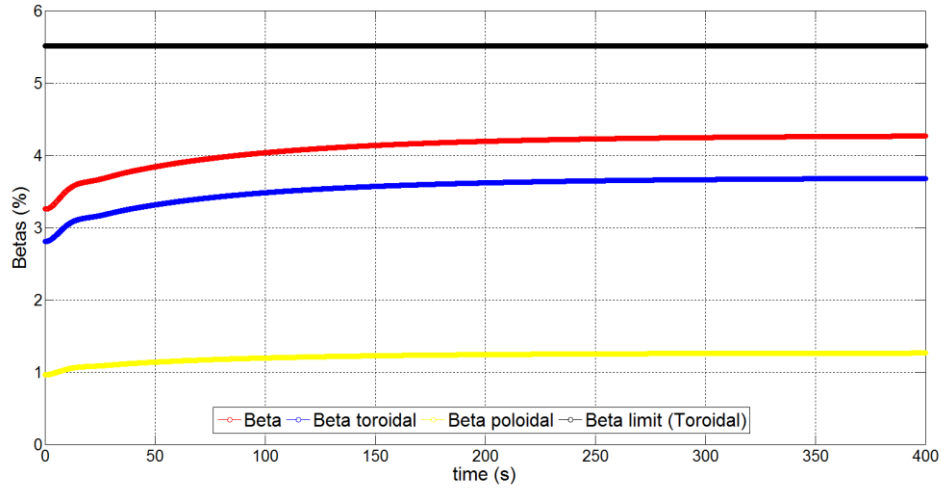


Figure 76: HCPB DEMO1 Fueling Rate sudden increase x1.25 Betas graphic.

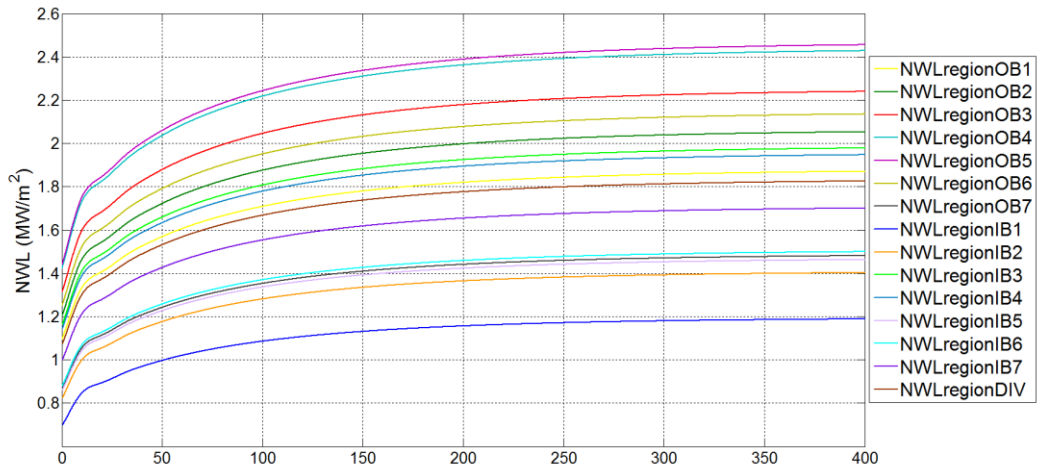


Figure 77: HCPB DEMO1 Fueling Rate sudden increase x1.25 NWL graphic.

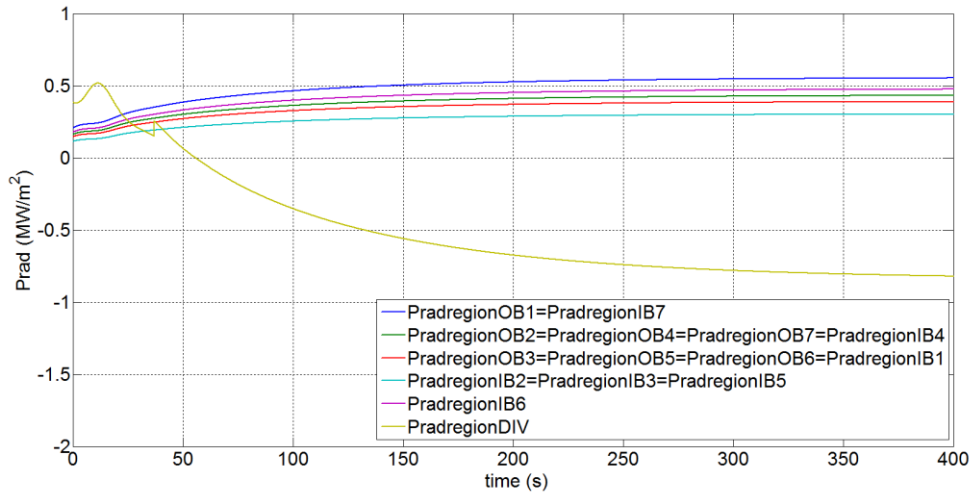


Figure 78: HCPB DEMO1 Fueling Rate sudden increase x1.25 Prad graphic.

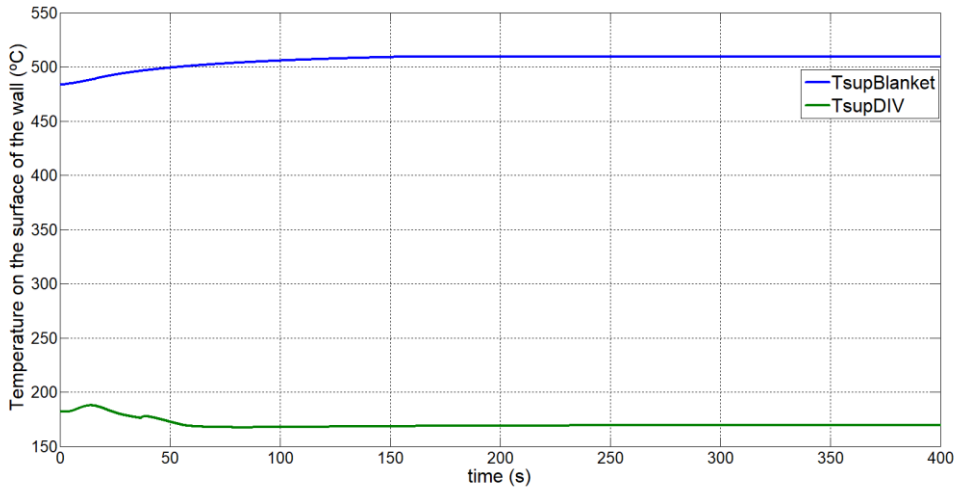


Figure 79: HCPB DEMO1 Fueling Rate sudden increase x1.25 Temperature on the surface of the blanket and divertor wall graphic.

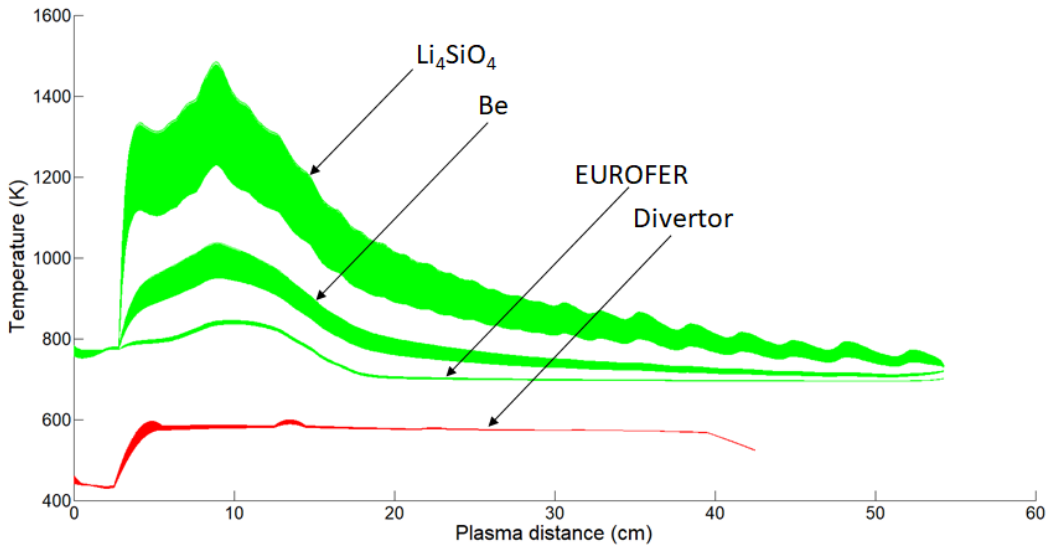


Figure 80: HCPB DEMO1 Fueling Rate sudden increase x1.25 evolution of the BB and divertor temperature graphic.

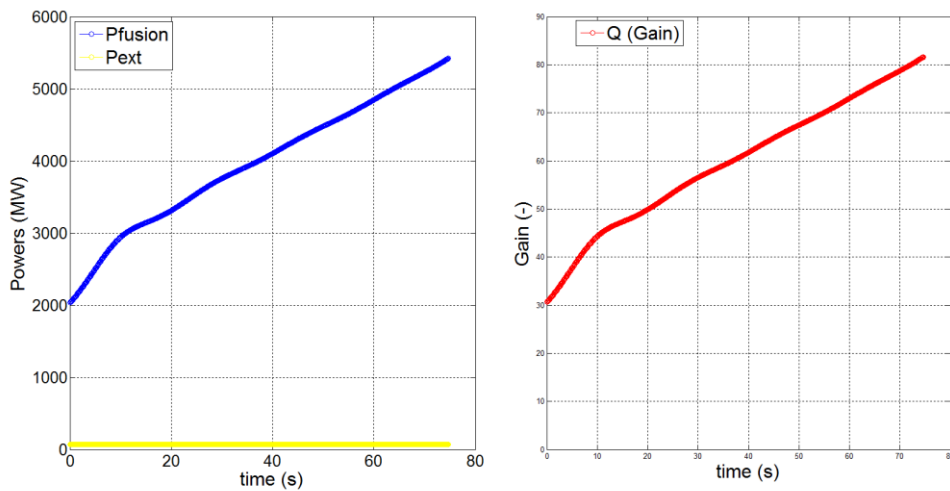


Figure 81: HCPB DEMO1 Fueling Rate sudden increase x1.5 P<sub>fus</sub> and gain graphic.

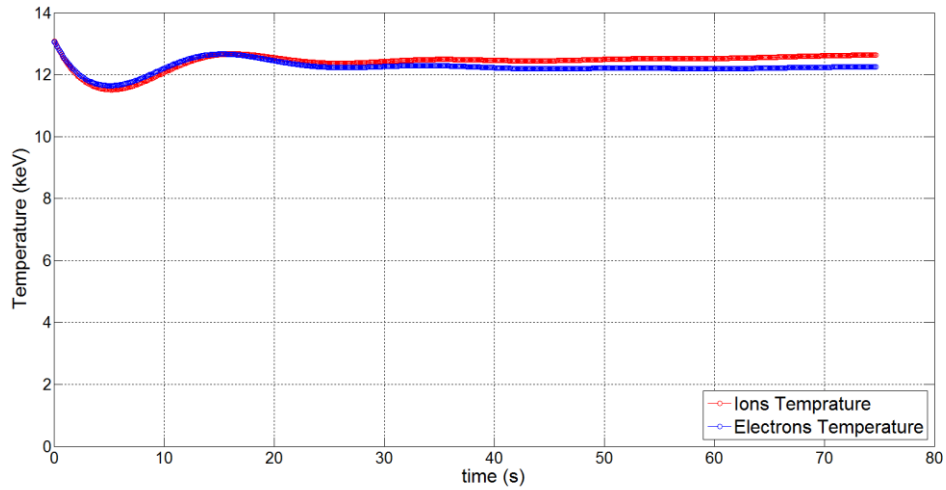


Figure 82: HCPB DEMO1 Fueling Rate sudden increase x1.5 Temperatures graphic.

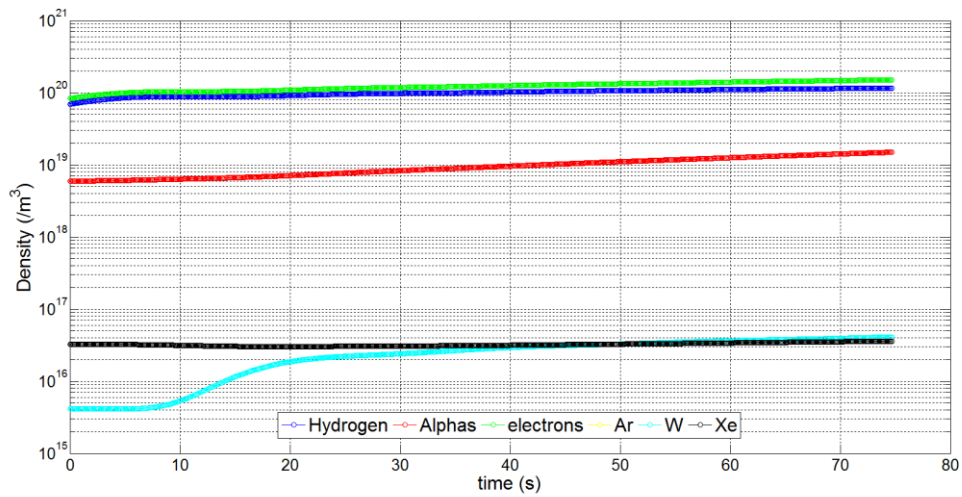


Figure 83: HCPB DEMO1 Fueling Rate sudden increase x1.5 Densities graphic.

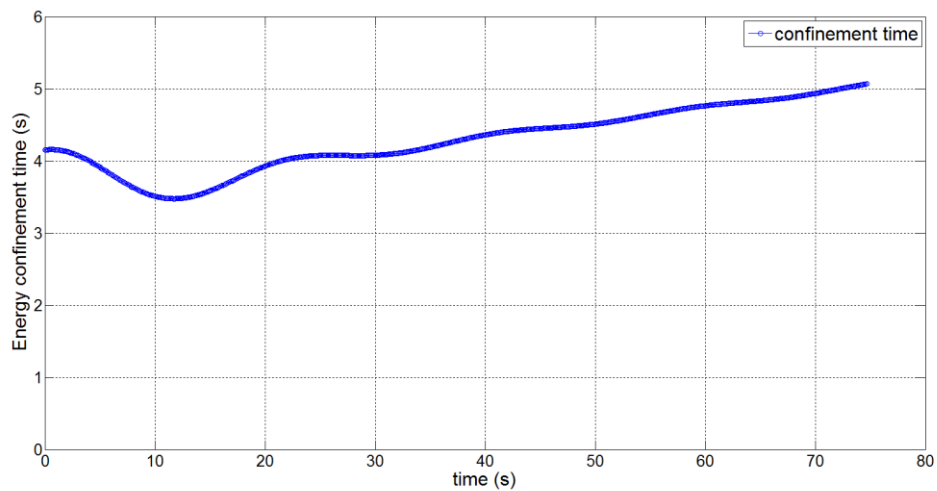


Figure 84: HCPB DEMO1 Fueling Rate sudden increase x1.5 Confinement time graphic.

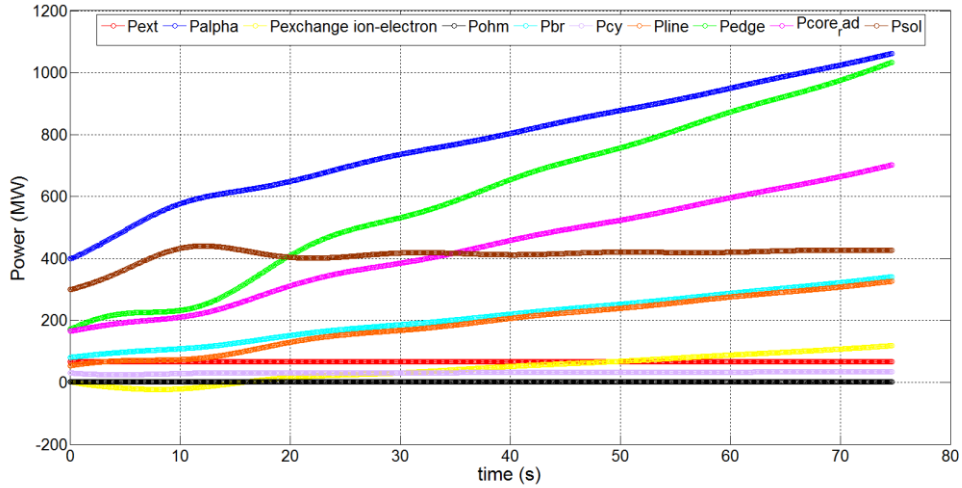


Figure 85: HCPB DEMO1 Fueling Rate sudden increase x1.5 Powers graphic.

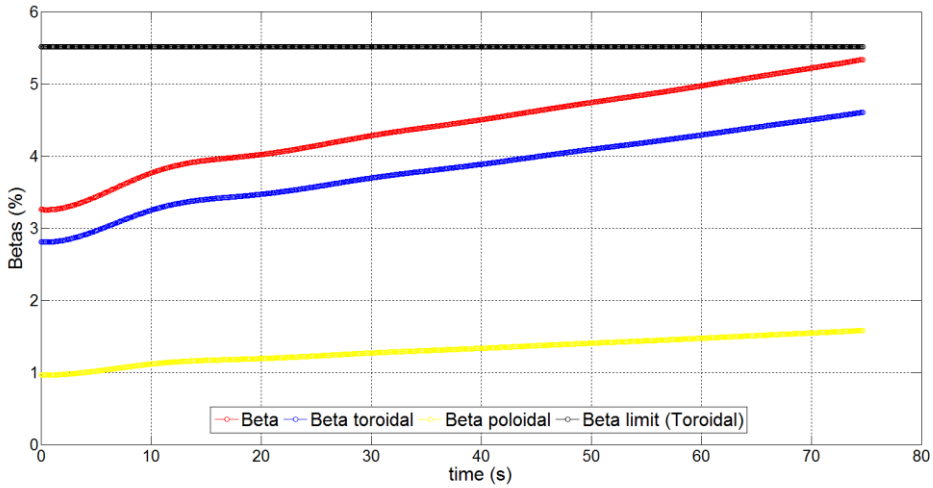


Figure 86: HCPB DEMO1 Fueling Rate sudden increase x1.5 Betas graphic.

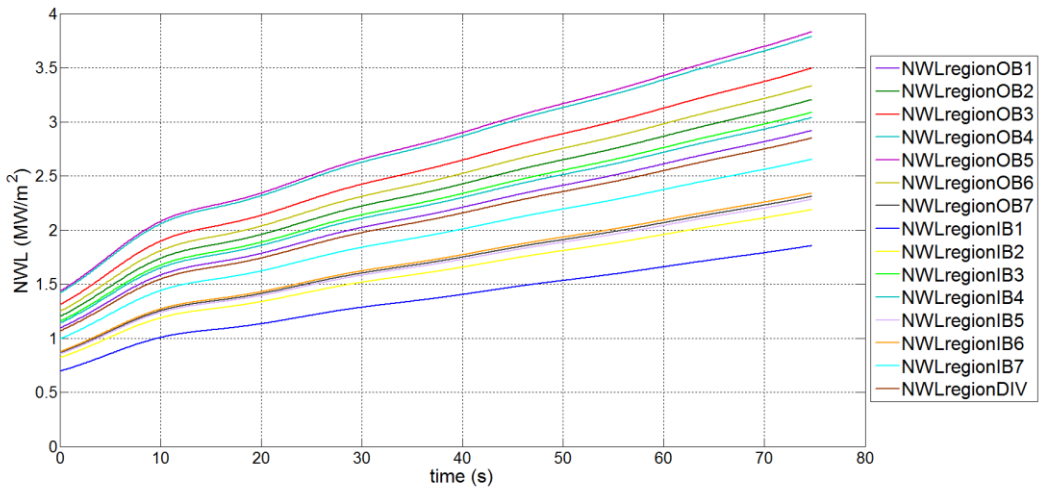


Figure 87: HCPB DEMO1 Fueling Rate sudden increase x1.5 NWL graphic.

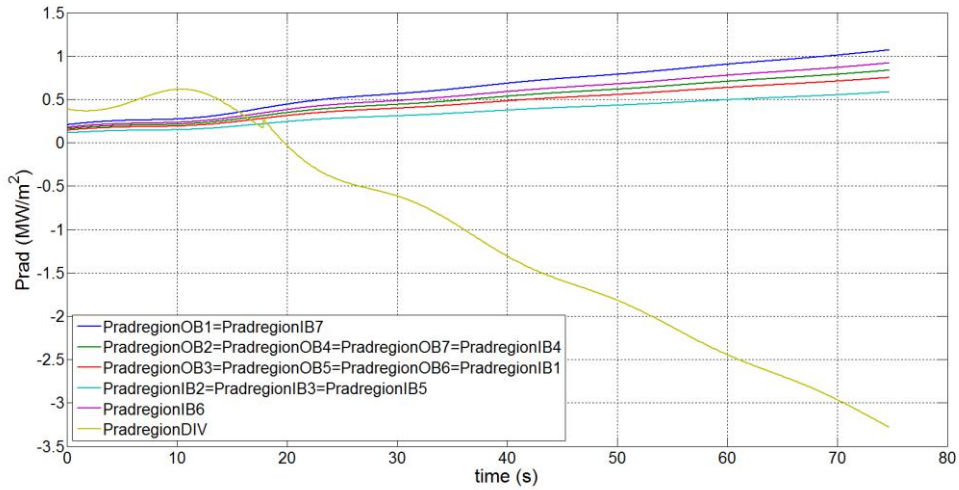


Figure 88: HCPB DEMO1 Fueling Rate sudden increase x1.5  $P_{rad}$  graphic.

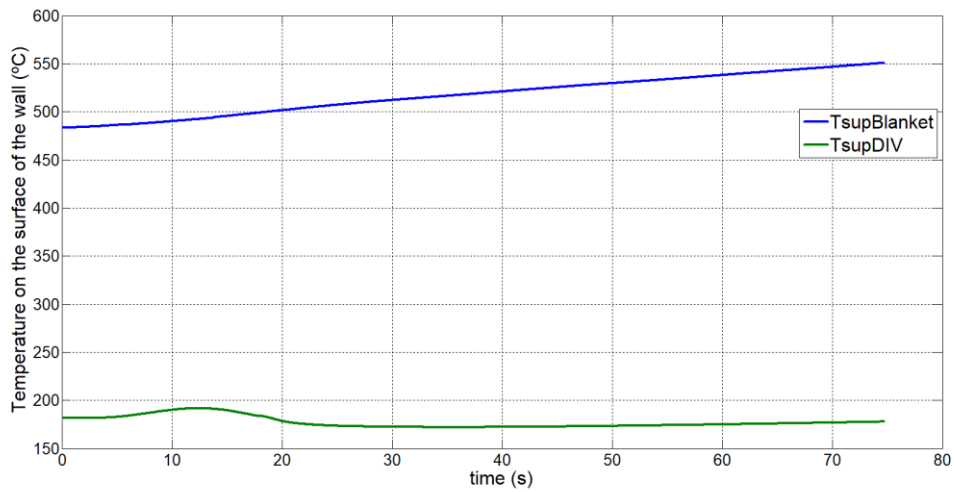


Figure 89: HCPB DEMO1 Fueling Rate sudden increase x1.5 Temperature on the surface of the blanket and divertor wall graphic.

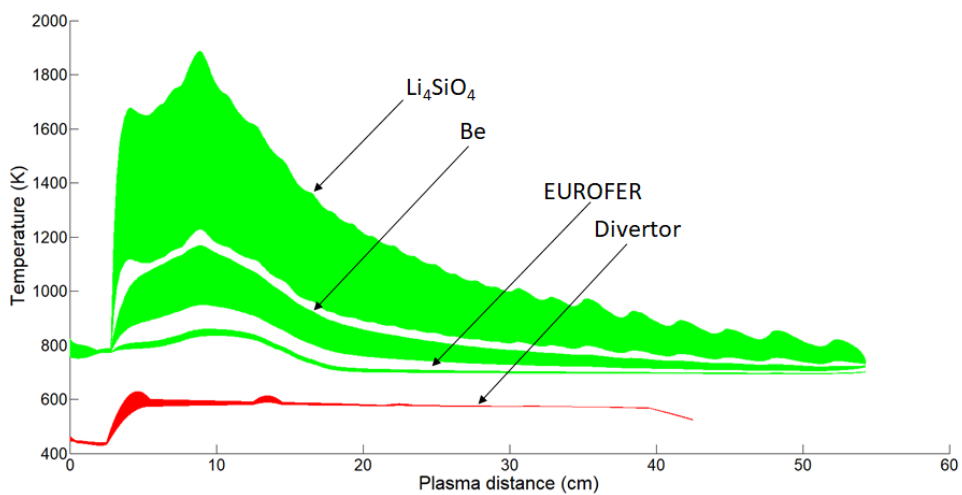


Figure 90: HCPB DEMO1 Fueling Rate sudden increase x1.5 evolution of the BB and divertor temperature graphic.

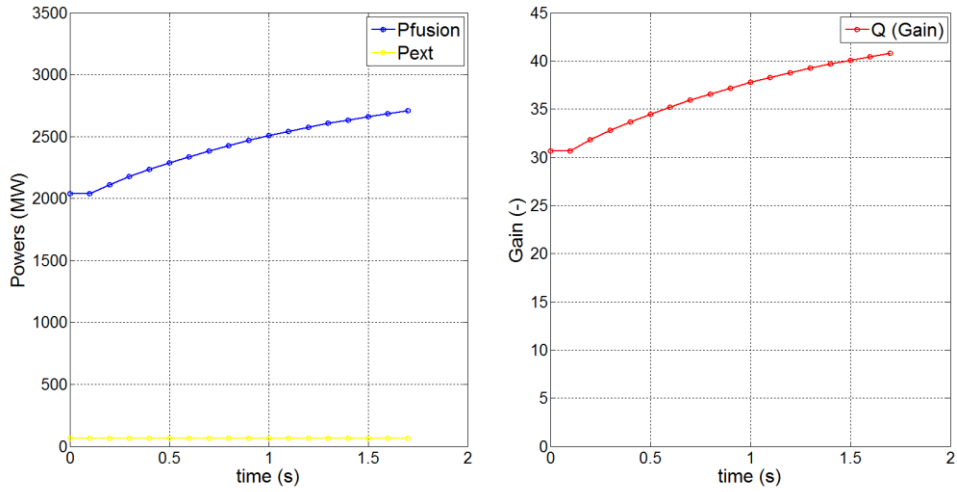


Figure 91: HCPB DEMO1 Fueling Rate sudden increase x6  $P_{fus}$  and gain graphic.

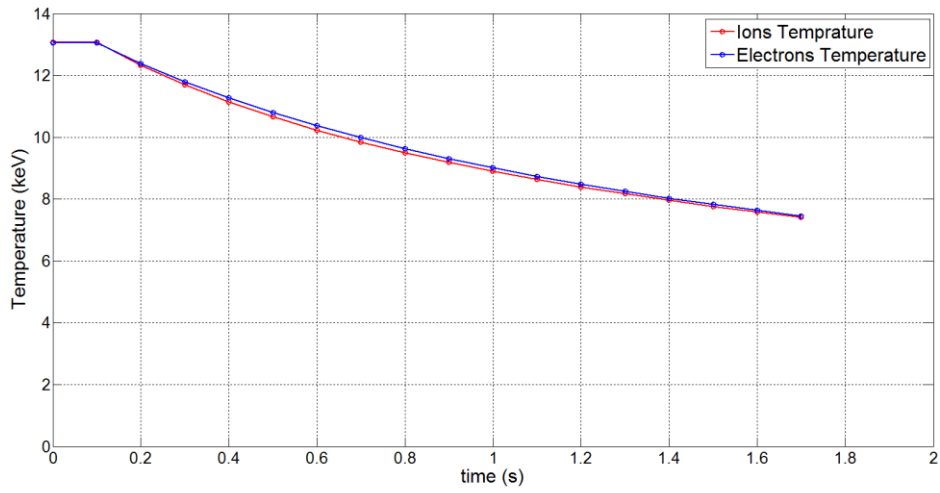


Figure 92: HCPB DEMO1 Fueling Rate sudden increase x6 Temperatures graphic.

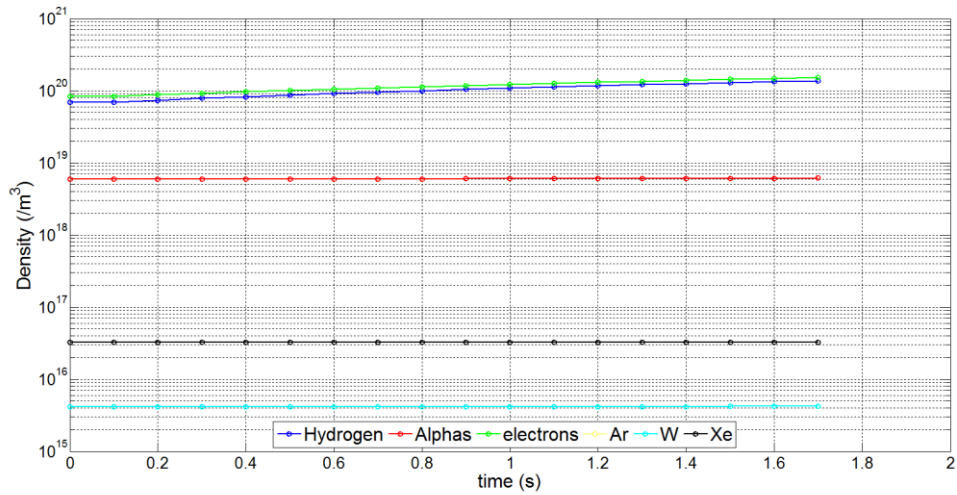


Figure 93: HCPB DEMO1 Fueling Rate sudden increase x6 Densities graphic.



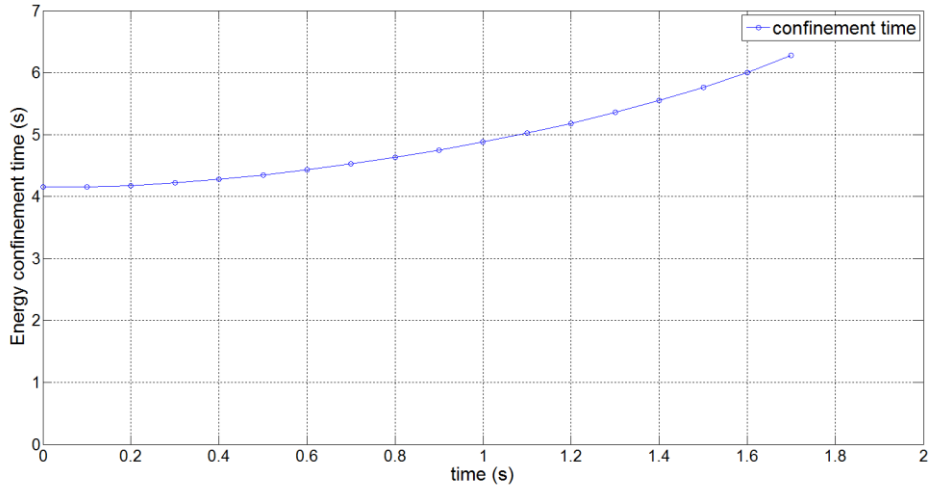


Figure 94: HCPB DEMO1 Fueling Rate sudden increase x6 Confinement time graphic.

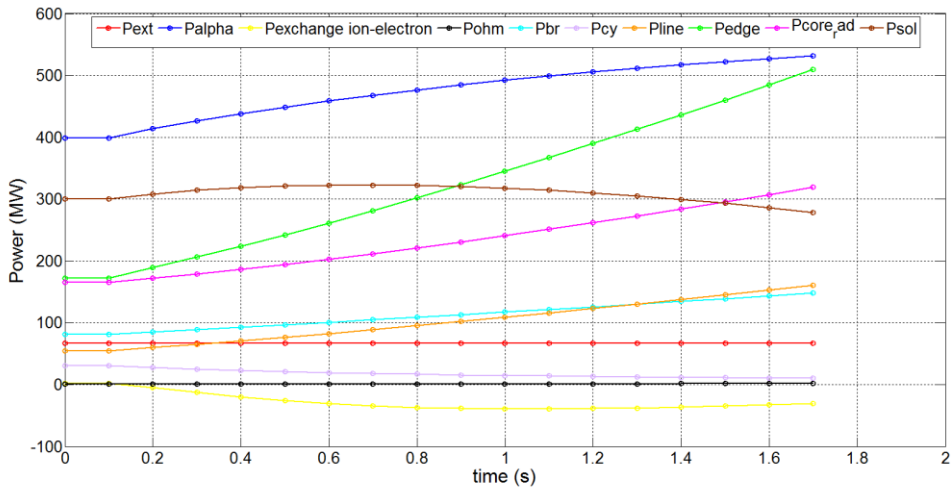


Figure 95: HCPB DEMO1 Fueling Rate sudden increase x6 Powers graphic.

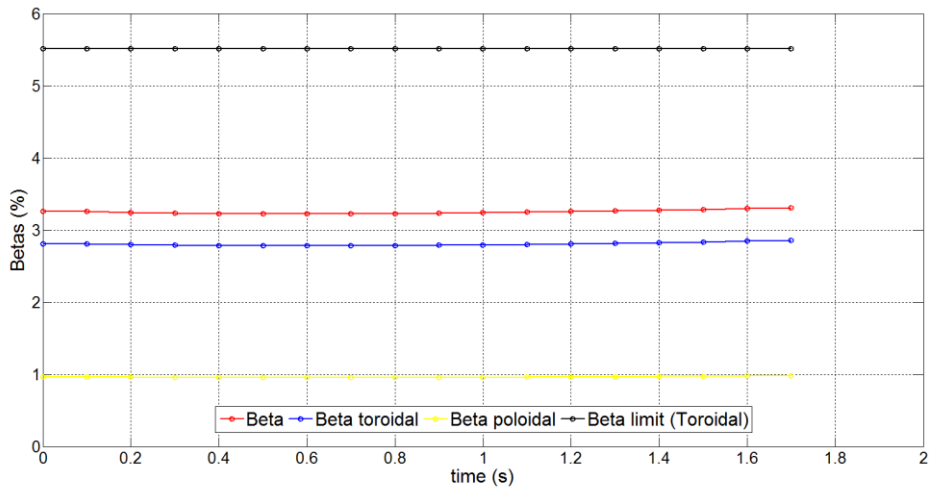


Figure 96: HCPB DEMO1 Fueling Rate sudden increase x6 Betas graphic.

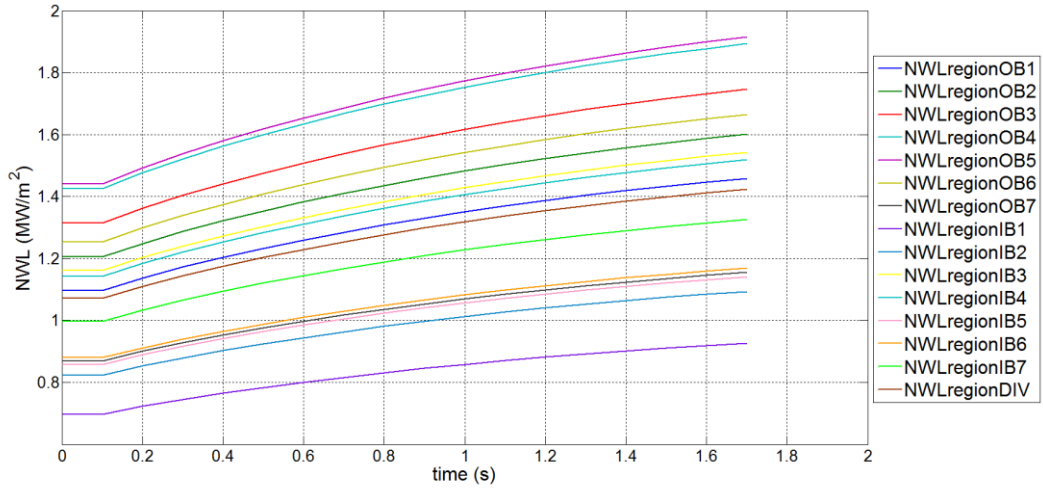


Figure 97: HCPB DEMO1 Fueling Rate sudden increase x6 NWL graphic.

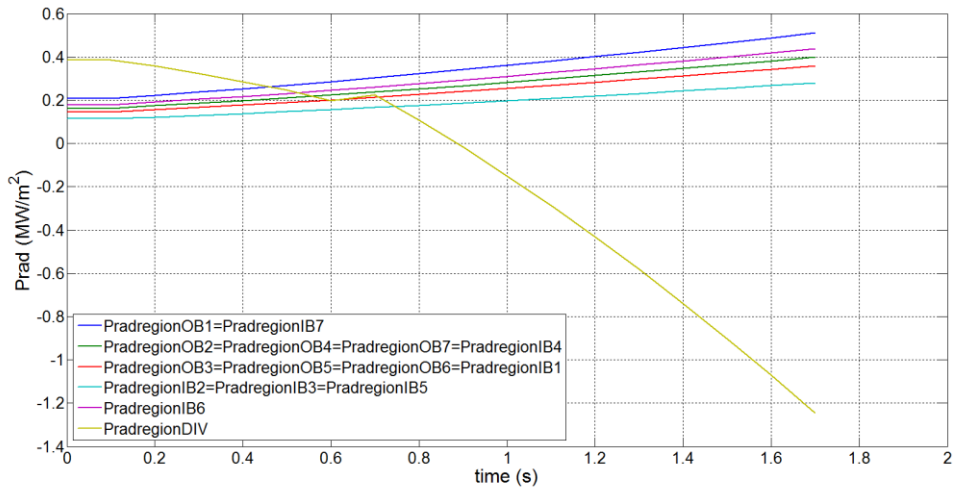


Figure 98: HCPB DEMO1 Fueling Rate sudden increase x6 Prad graphic.

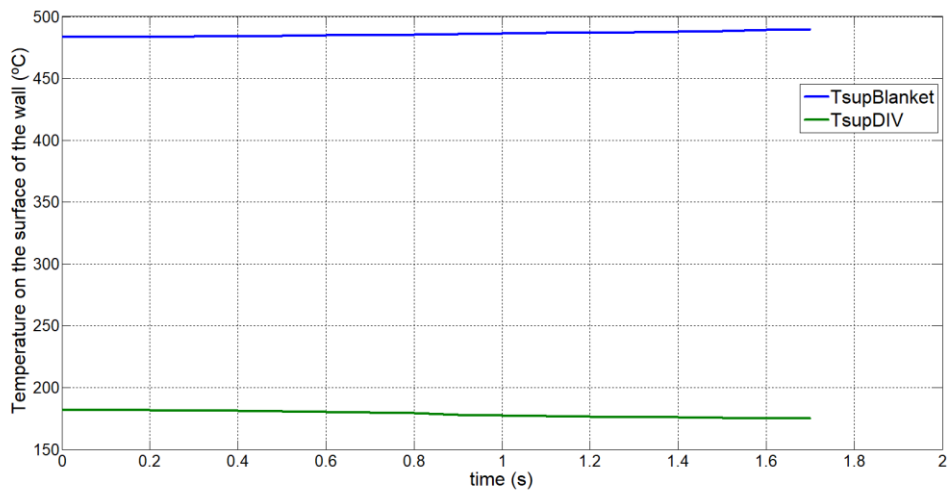


Figure 99: HCPB DEMO1 Fueling Rate sudden increase x6 Temperature on the surface of the blanket and divertor wall graphic.

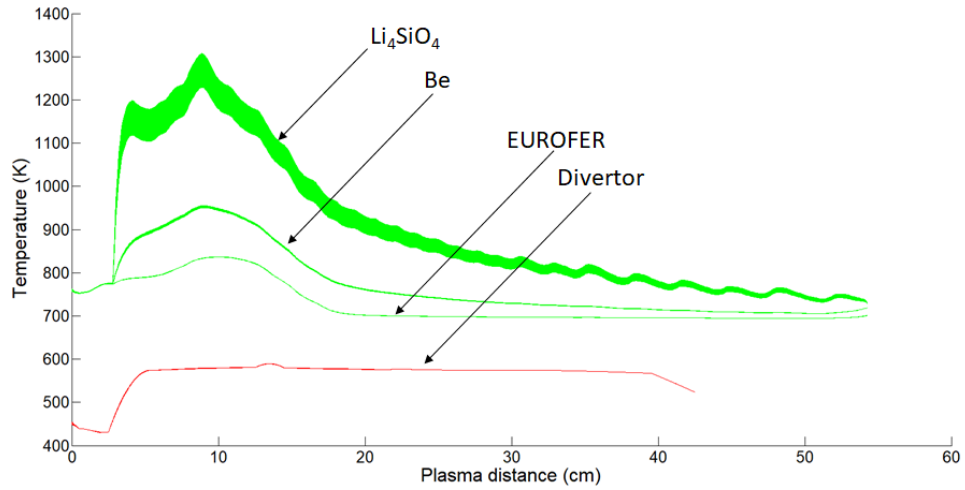


Figure 100: HCPB DEMO1 Fueling Rate sudden increase x6 evolution of the BB and divertor temperature graphic.

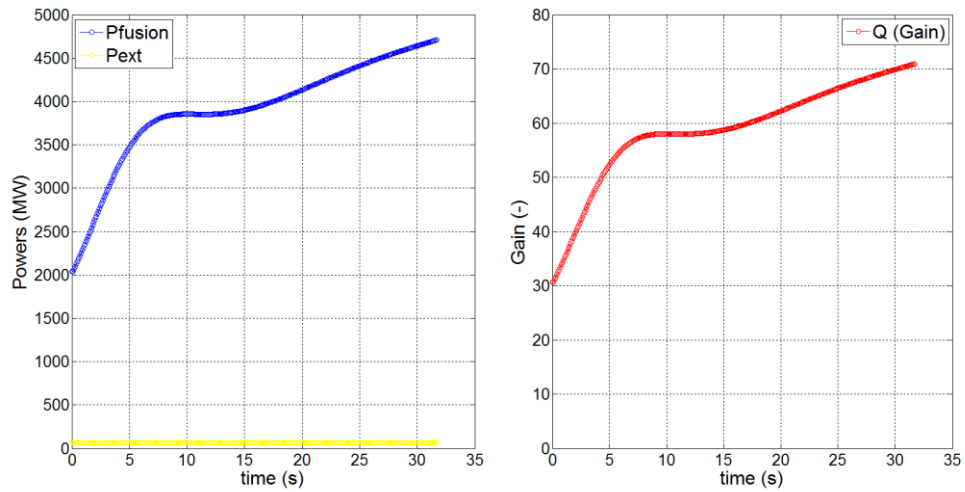


Figure 101: HCPB DEMO1 Confinement time improvement x1.5  $P_{fus}$  and gain graphic.

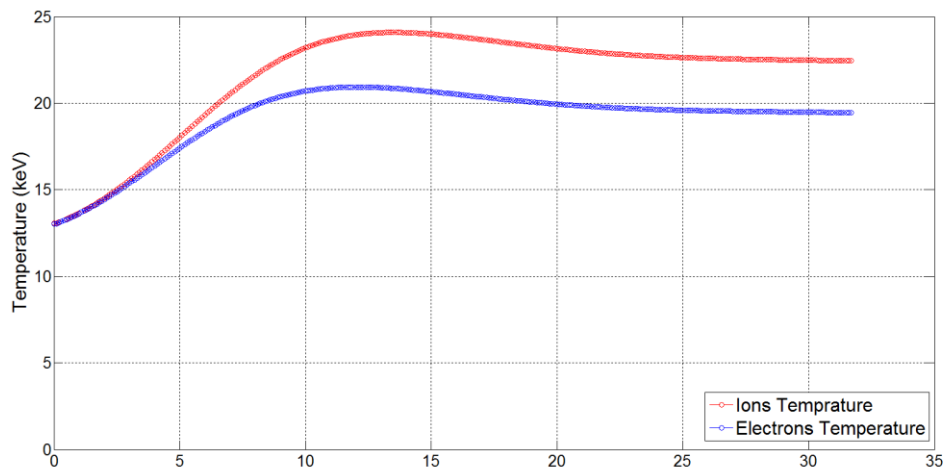


Figure 102: HCPB DEMO1 Confinement time improvement x1.5 Temperatures graphic.

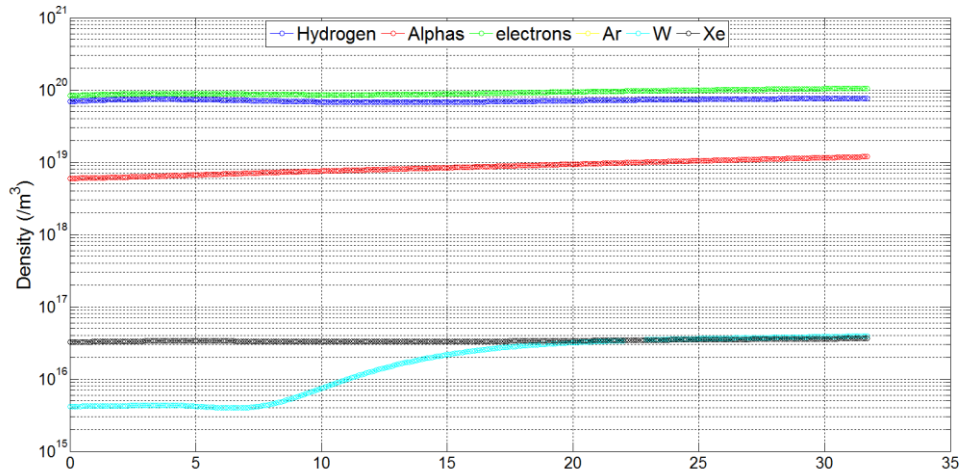


Figure 103: HCPB DEMO1 Confinement time improvement x1.5 Densities graphic.

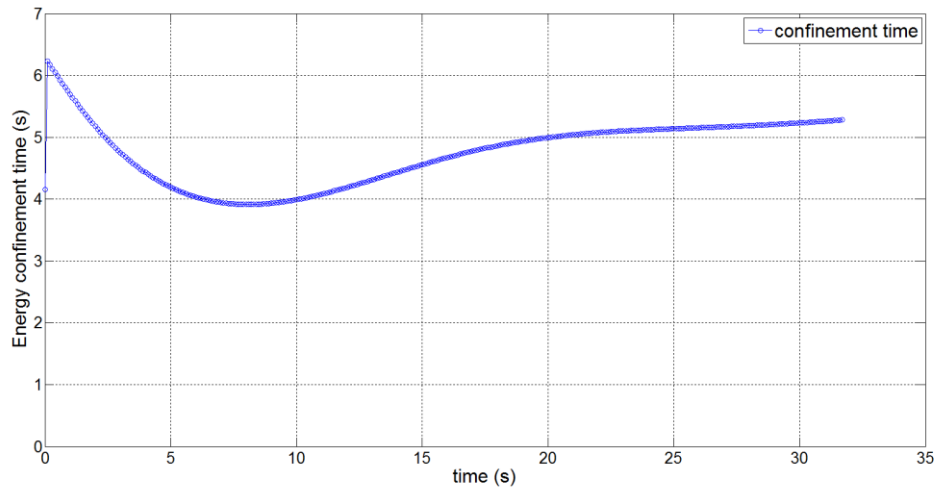


Figure 104: HCPB DEMO1 Confinement time improvement x1.5 Confinement time graphic.

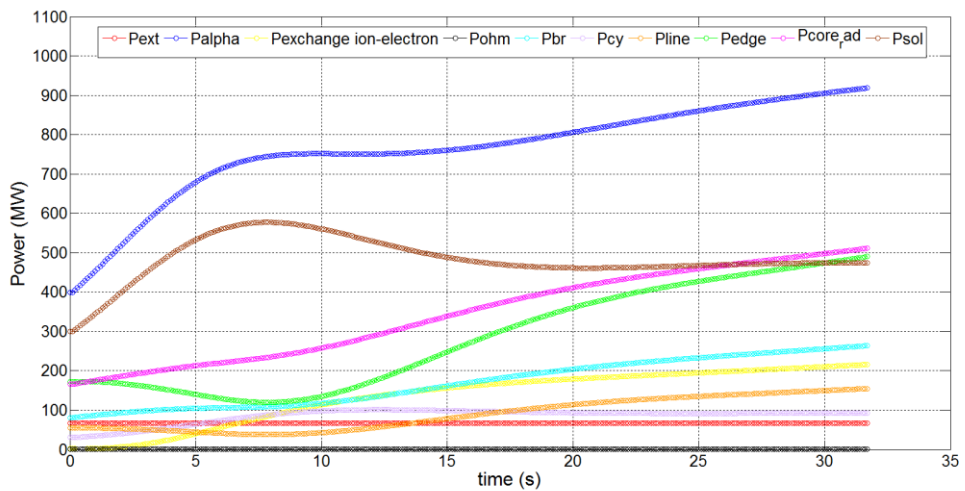


Figure 105: HCPB DEMO1 Confinement time improvement x1.5 Powers graphic.

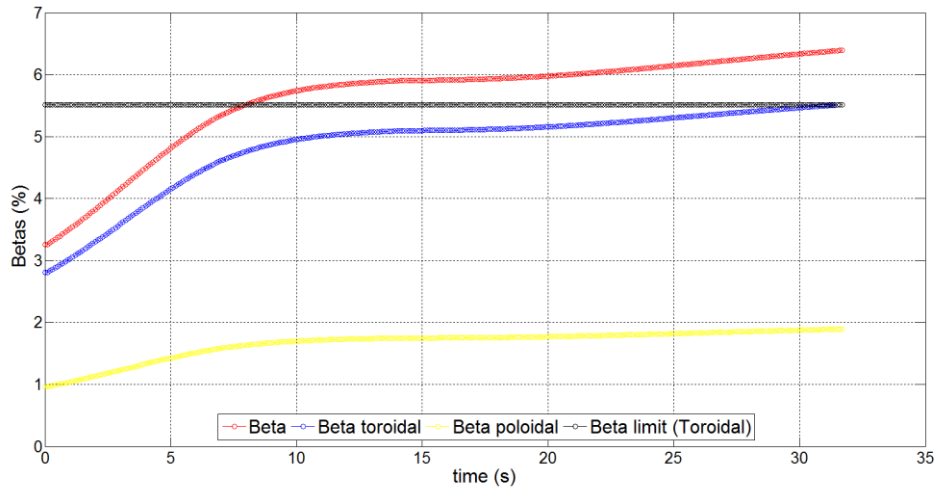


Figure 106: HCPB DEMO1 Confinement time improvement x1.5 Betas graphic.

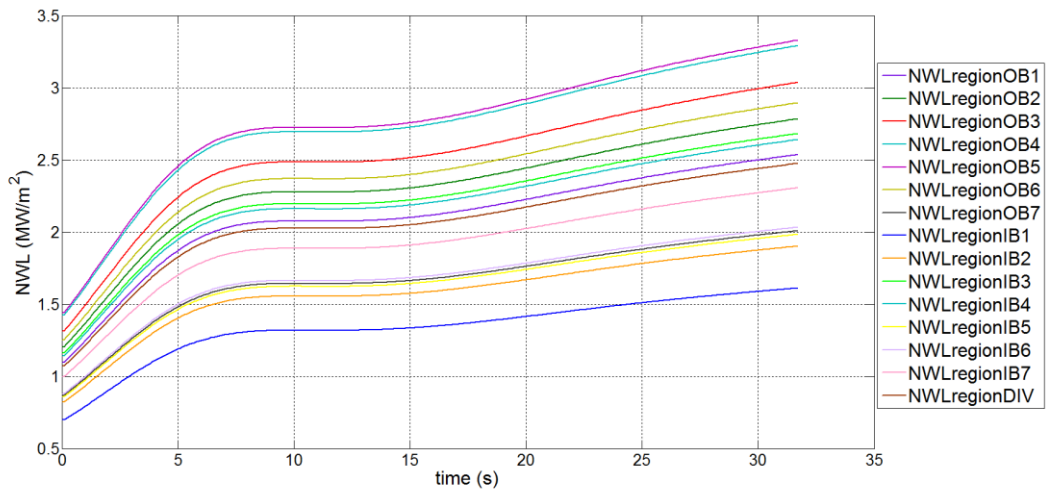


Figure 107: HCPB DEMO1 Confinement time improvement x1.5 NWL graphic.

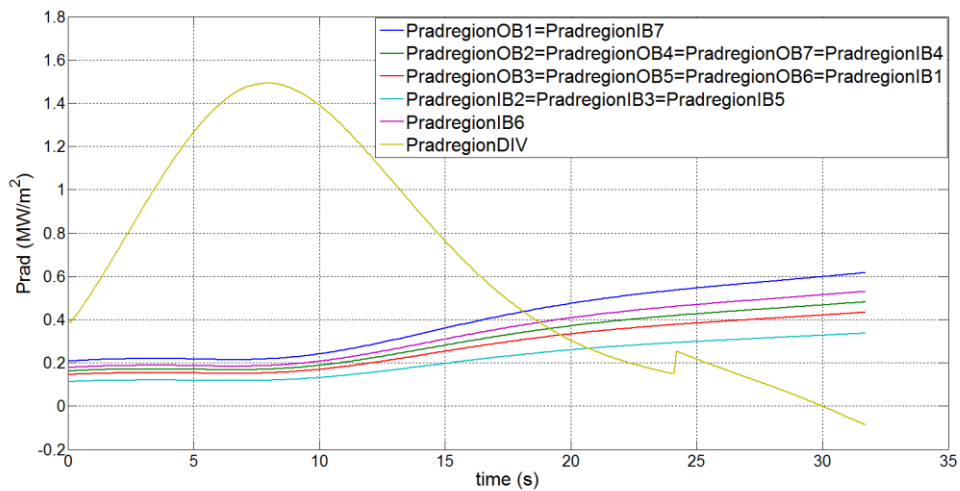


Figure 108: HCPB DEMO1 Confinement time improvement x1.5  $P_{rad}$  graphic.

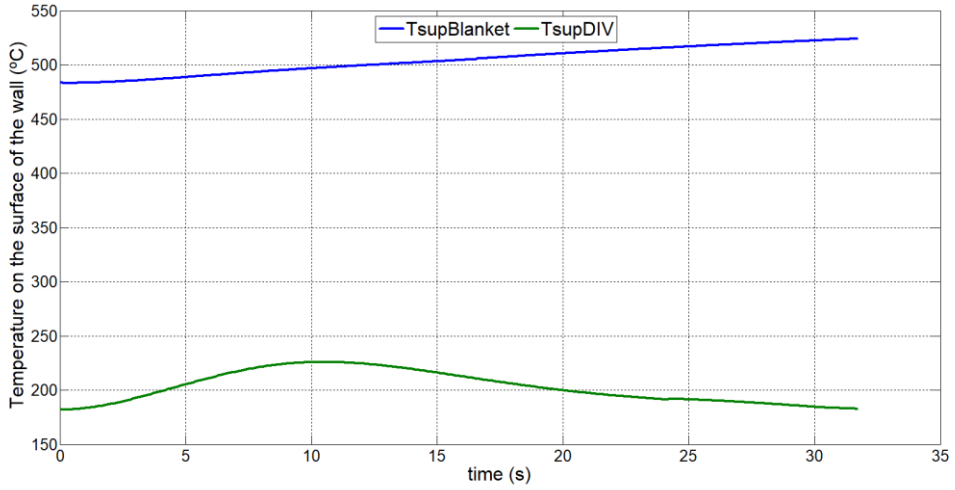


Figure 109: HCPB DEMO1 Confinement time improvement x1.5 Temperature on the surface of the blanket and divertor wall graphic.

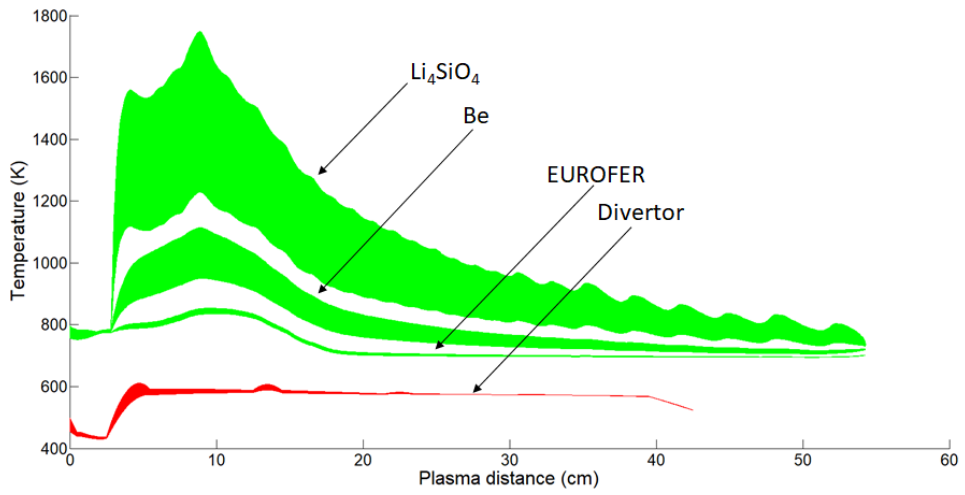


Figure 110: HCPB DEMO1 Confinement time improvement x1.5 evolution of the BB and divertor temperature graphic.

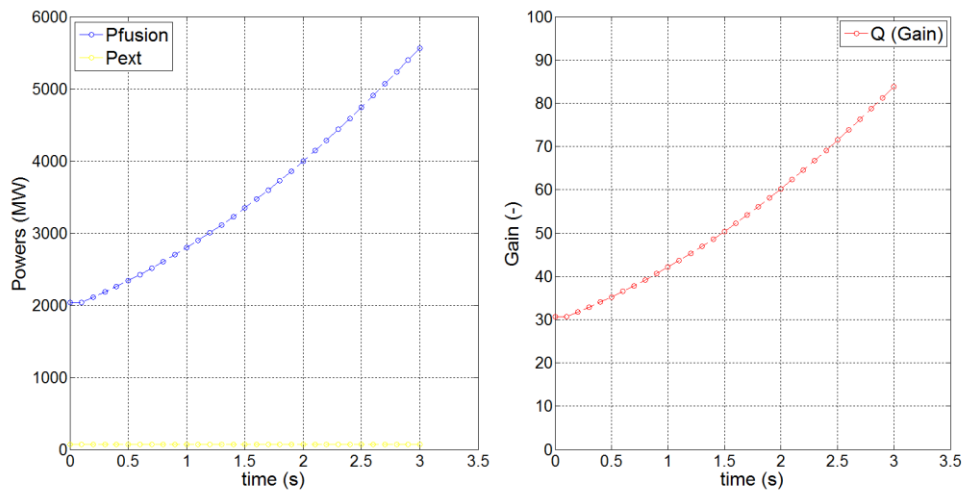


Figure 111: HCPB DEMO1 Confinement time improvement x5 P<sub>fus</sub> and gain graphic.

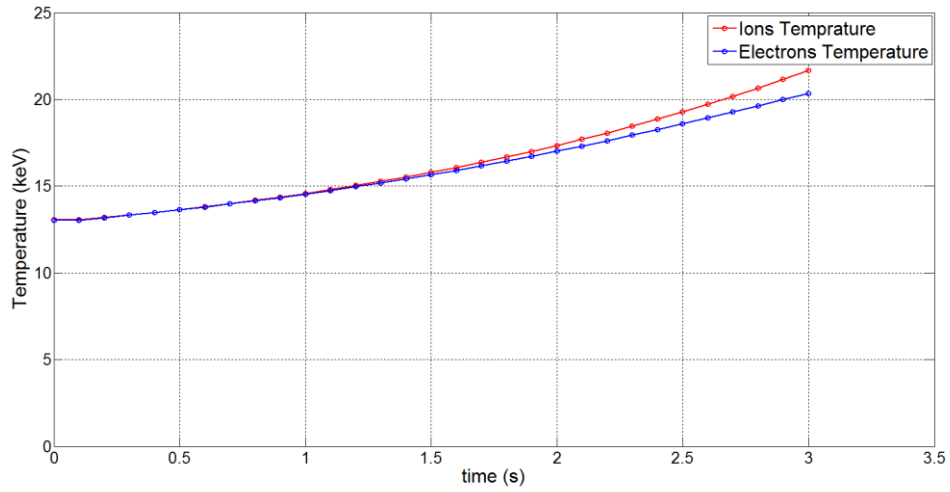


Figure 112: HCPB DEMO1 Confinement time improvement x5 Temperatures graphic.

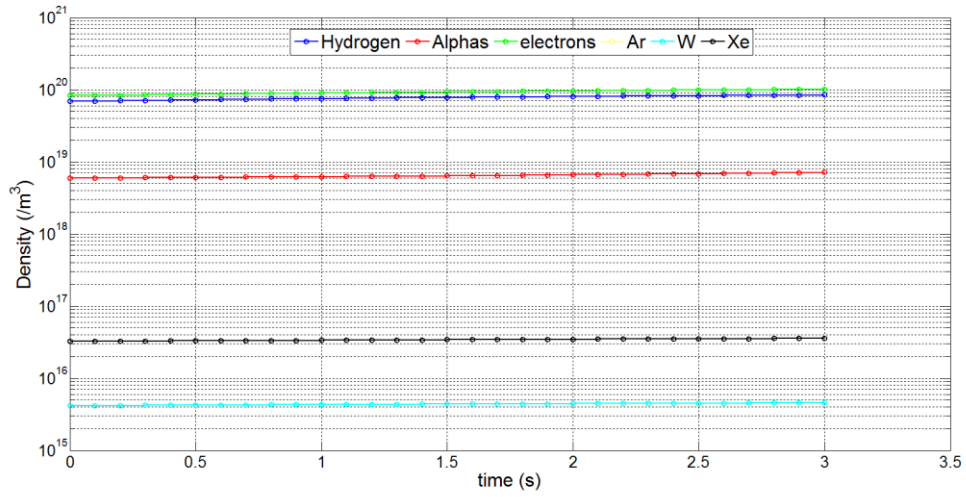


Figure 113: HCPB DEMO1 Confinement time improvement x5 Densities graphic.

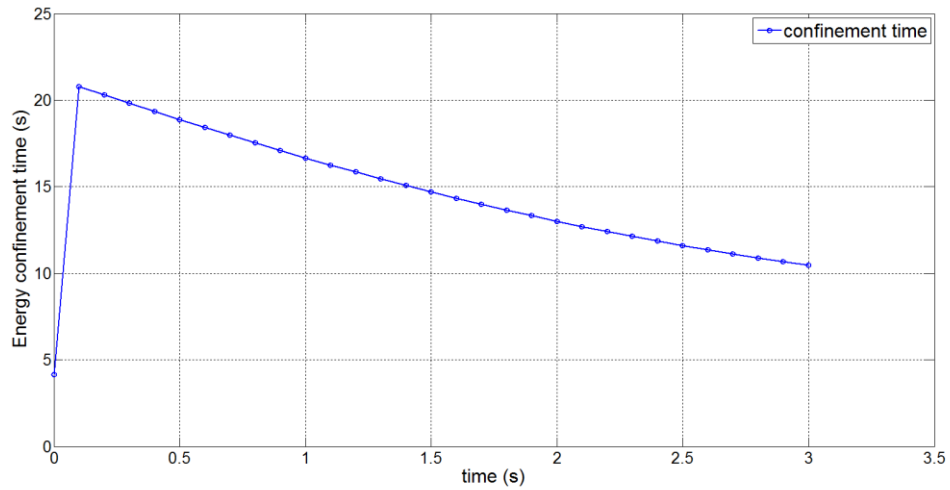


Figure 114: HCPB DEMO1 Confinement time improvement x5 Confinement time graphic.

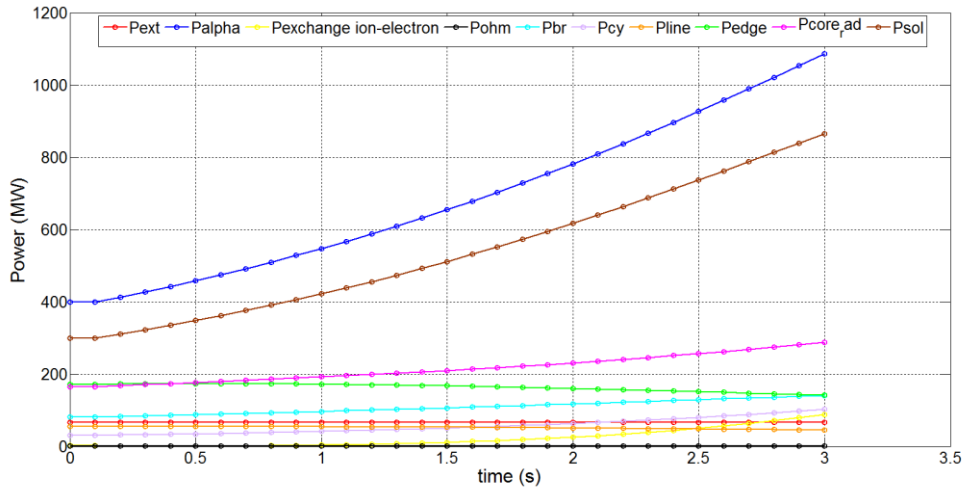


Figure 115: HCPB DEMO1 Confinement time improvement x5 Powers graphic.

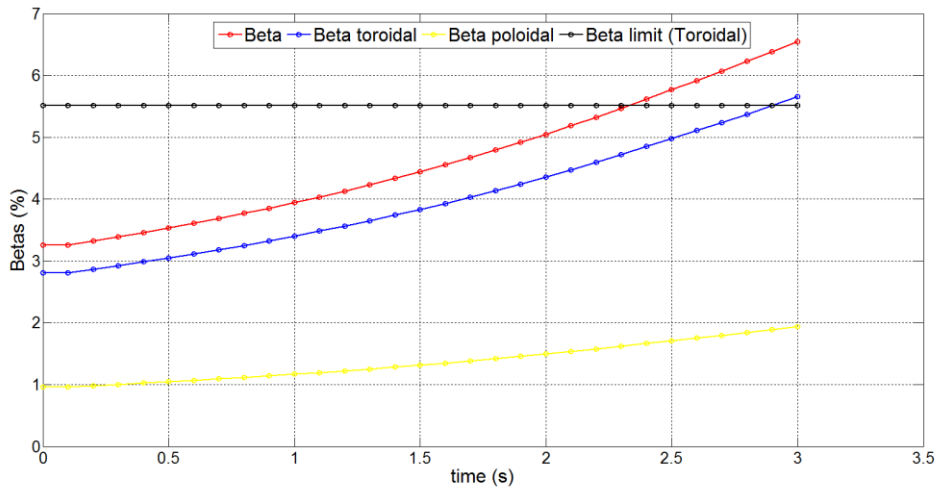


Figure 116: HCPB DEMO1 Confinement time improvement x5 Betas graphic.

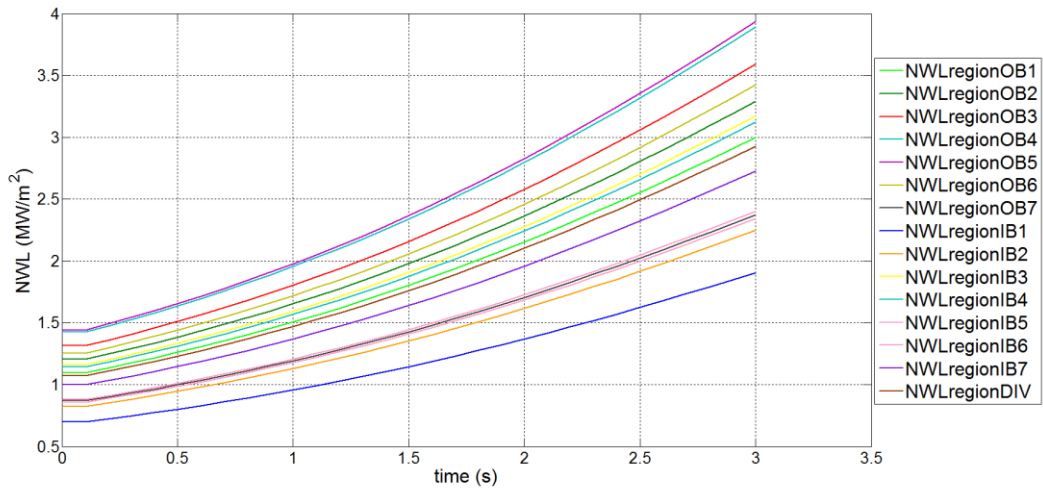


Figure 117: HCPB DEMO1 Confinement time improvement x5 NWL graphic.



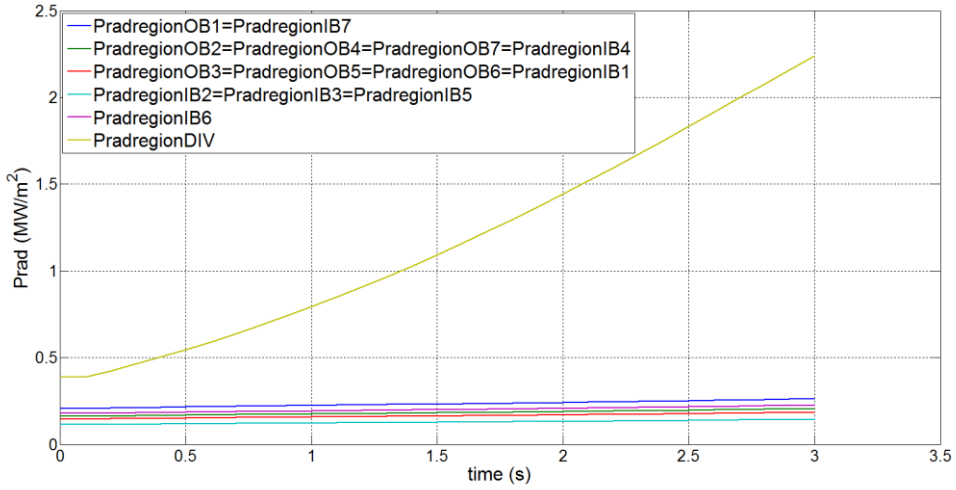


Figure 118: HCPB DEMO1 Confinement time improvement x5  $P_{rad}$  graphic.

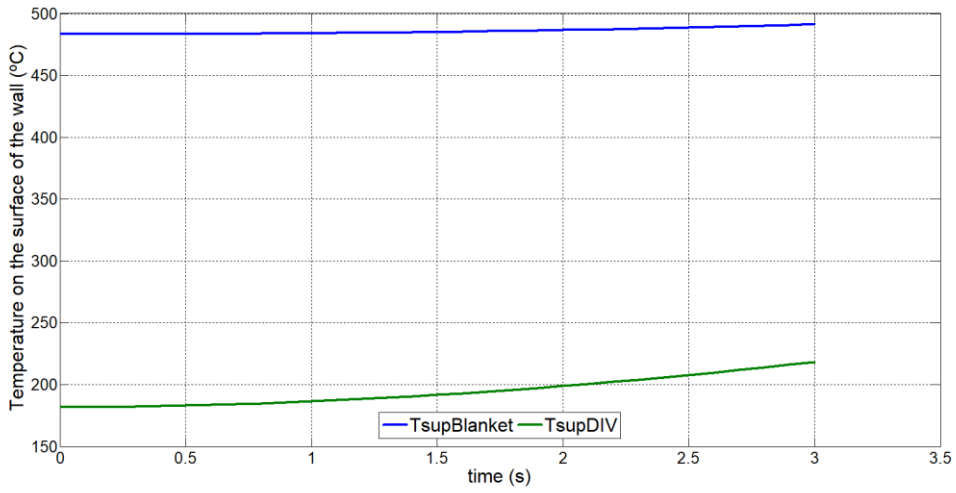


Figure 119: HCPB DEMO1 Confinement time improvement x5 Temperature on the surface of the blanket and divertor wall graphic.

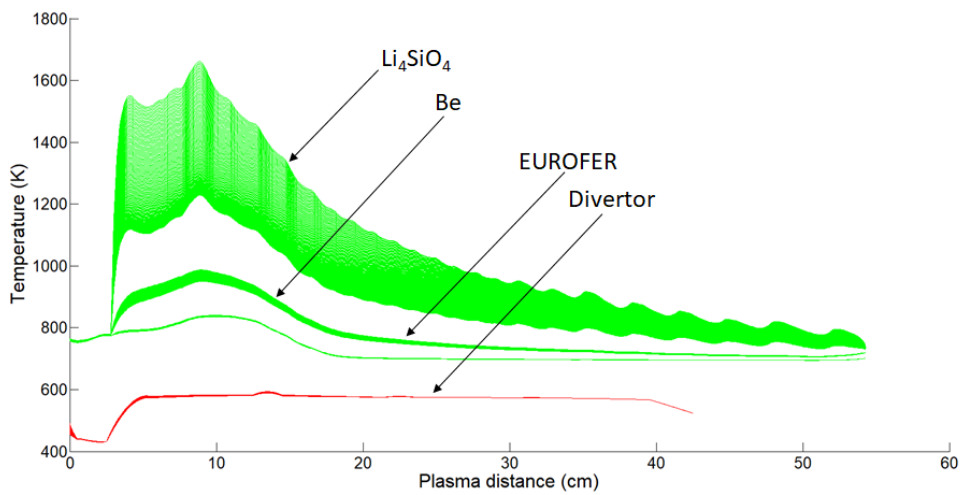


Figure 120: HCPB DEMO1 Confinement time improvement x5 evolution of the BB and divertor temperature graphic.

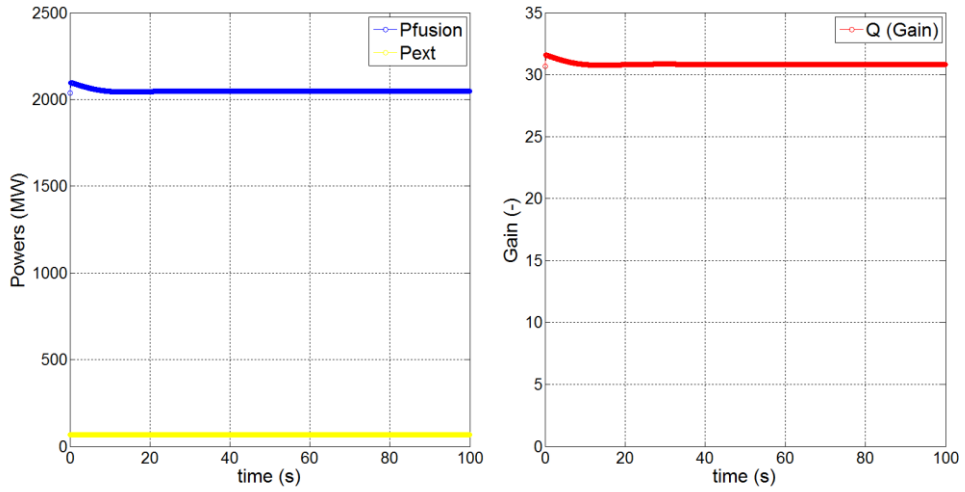


Figure 121: HCPB DEMO1 Occasional confinement time improvement x3  $P_{fus}$  and gain graphic.

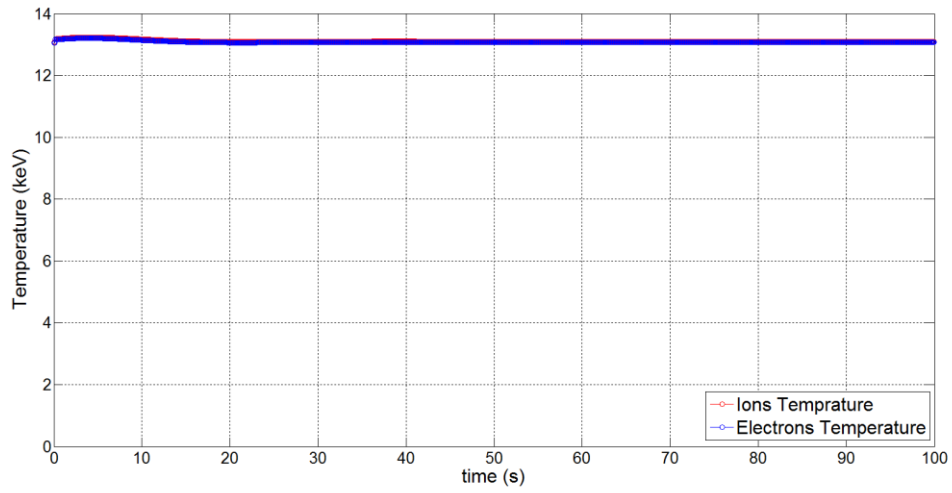


Figure 122: HCPB DEMO1 Occasional confinement time improvement x3 Temperatures graphic.

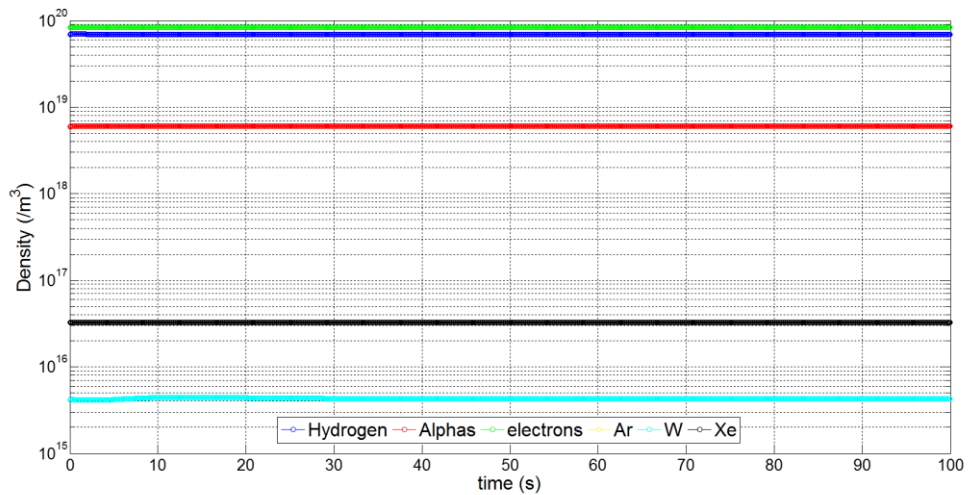


Figure 123: HCPB DEMO1 Occasional confinement time improvement x3 Densities graphic.

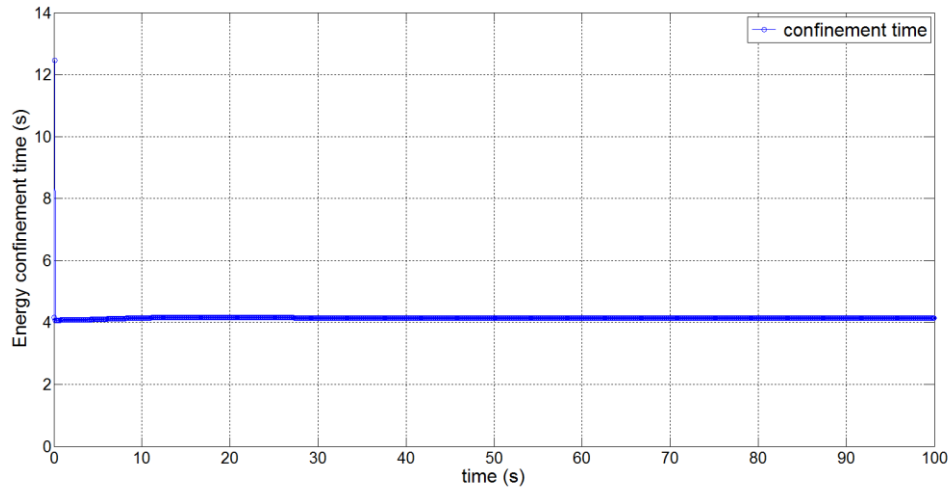


Figure 124: HCPB DEMO1 Occasional confinement time improvement x3 Confinement time graphic.

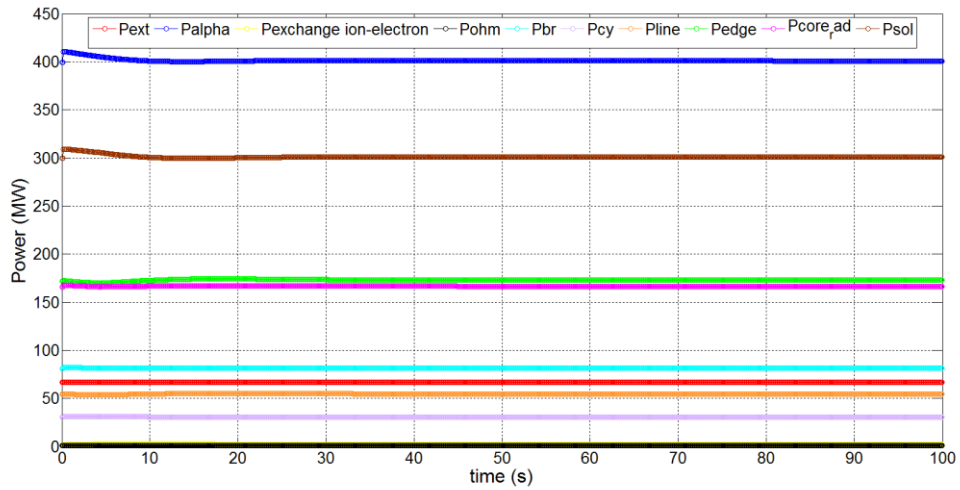


Figure 125: HCPB DEMO1 Occasional confinement time improvement x3 Powers graphic.

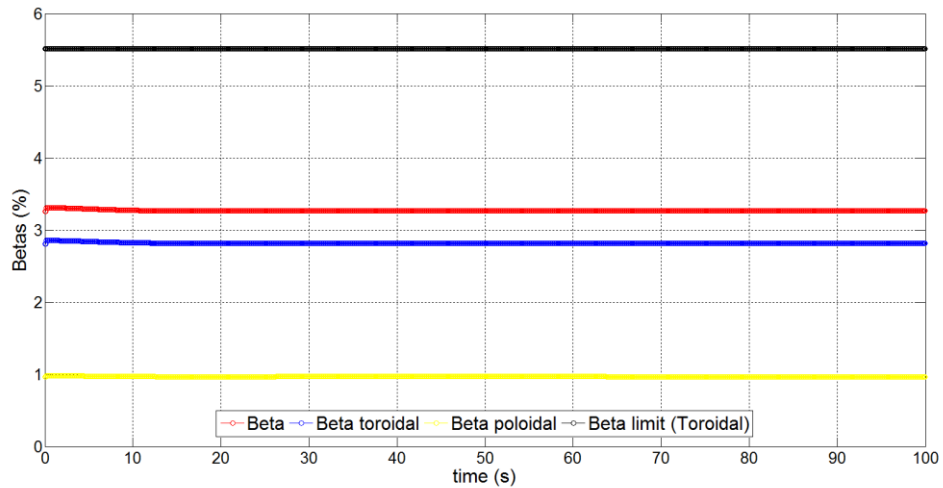


Figure 126: HCPB DEMO1 Occasional confinement time improvement x3 Betas graphic.

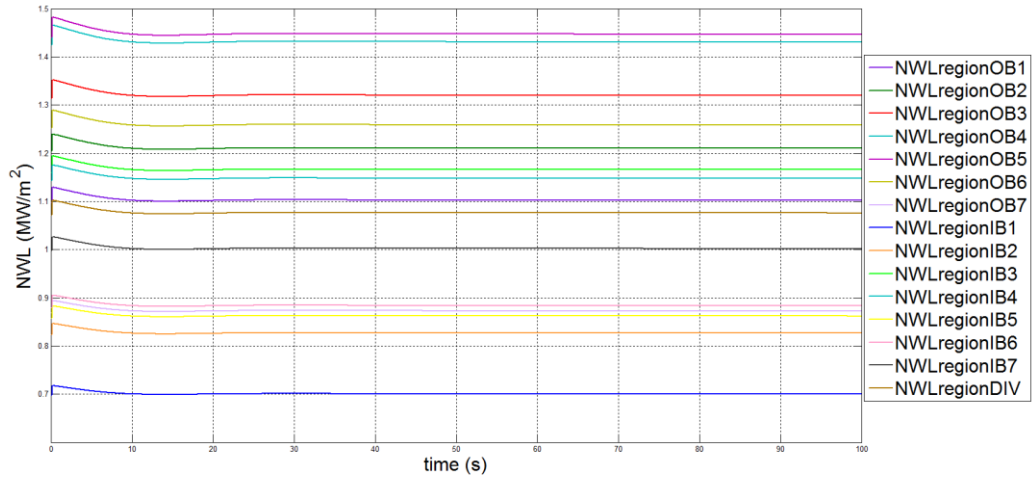


Figure 127: HCPB DEMO1 Occasional confinement time improvement x3 NWL graphic.

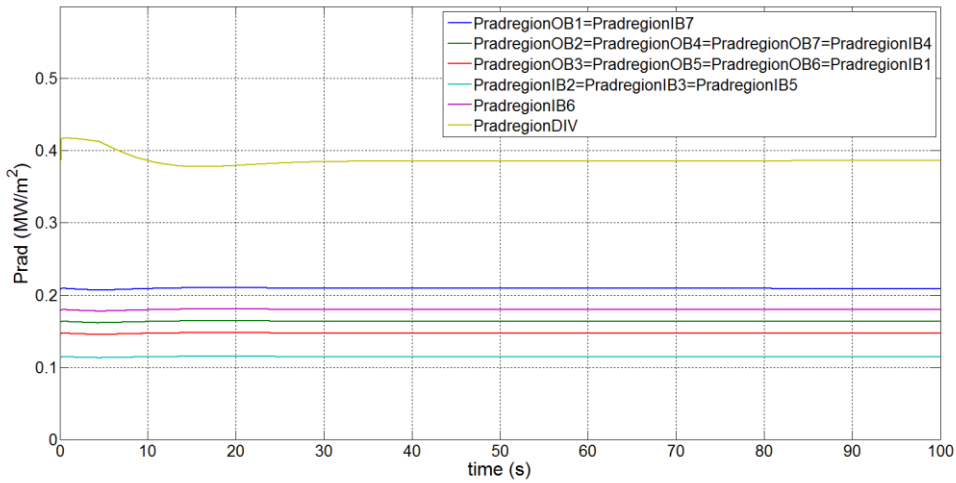


Figure 128: HCPB DEMO1 Occasional confinement time improvement x3  $P_{rad}$  graphic.

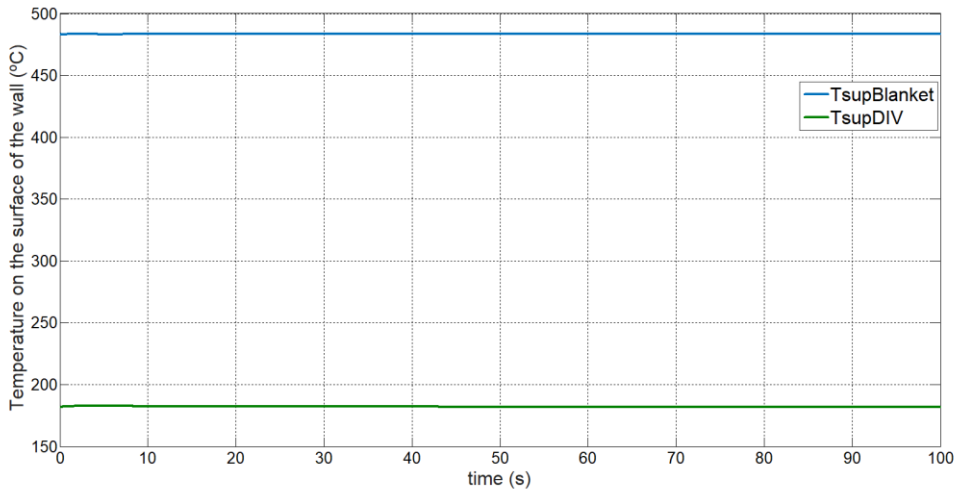


Figure 129: HCPB DEMO1 Occasional confinement time improvement x3 Temperature on the surface of the blanket and divertor wall graphic.

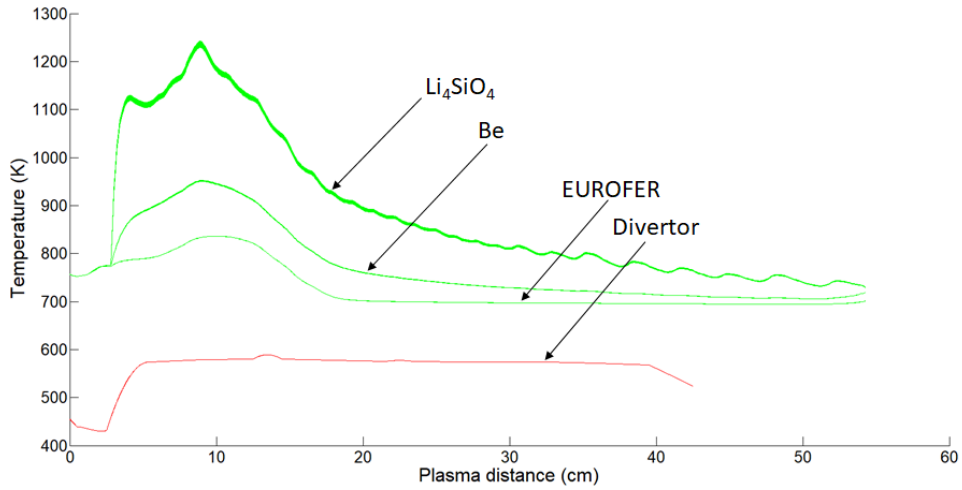


Figure 130: HCPB DEMO1 Occasional confinement time improvement x3 evolution of the BB and divertor temperature graphic.

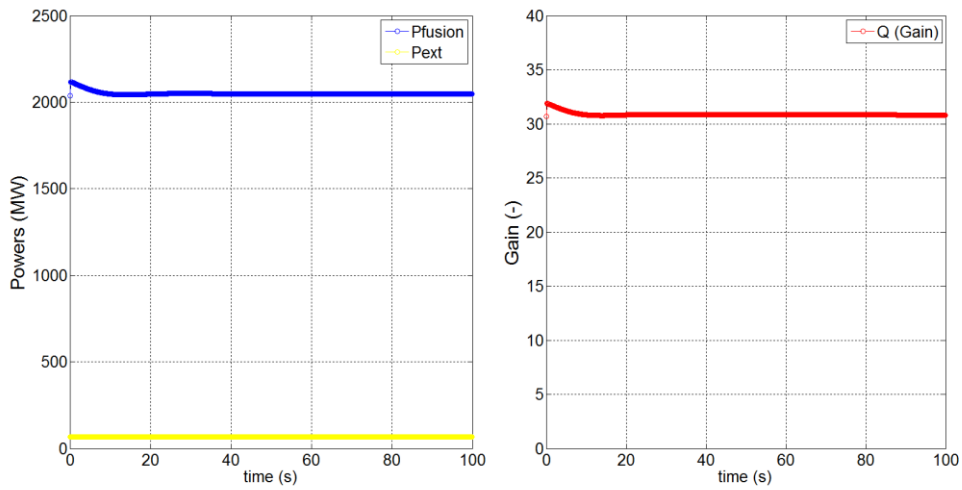


Figure 131: HCPB DEMO1 Occasional confinement time improvement x10  $P_{fus}$  and gain graphic.

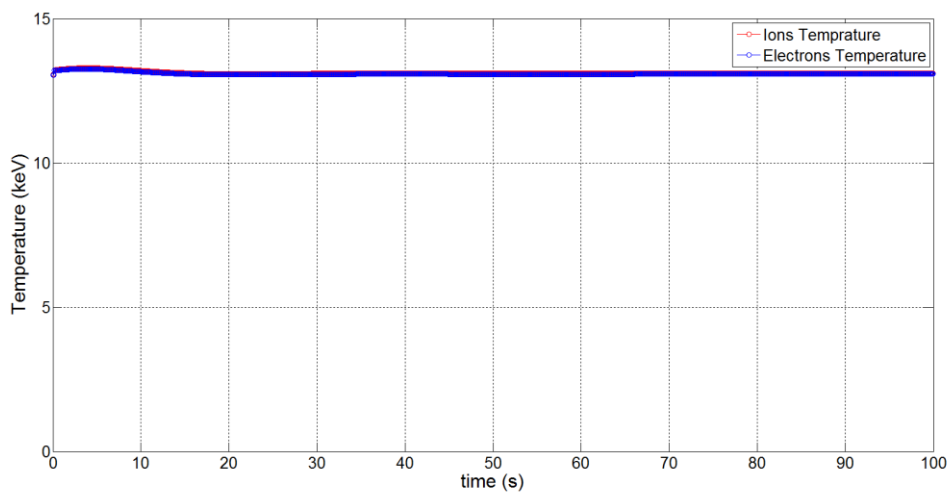


Figure 132: HCPB DEMO1 Occasional confinement time improvement x10 Temperatures graphic.

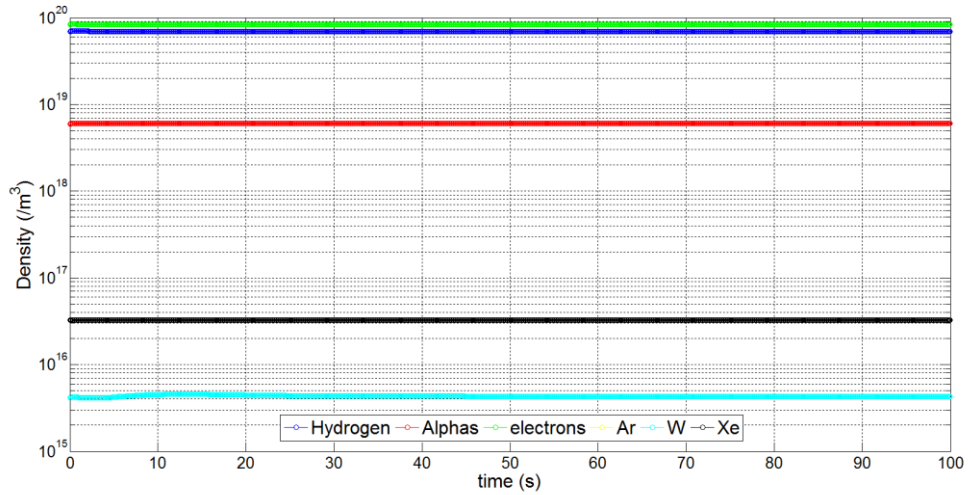


Figure 133: HCPB DEMO1 Occasional confinement time improvement x10 Densities graphic.

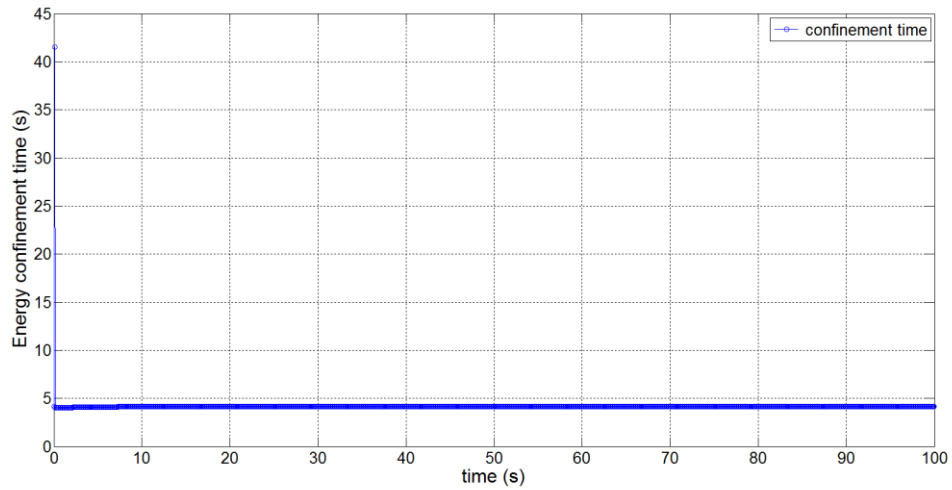


Figure 134: HCPB DEMO1 Occasional confinement time improvement x10 Confinement time graphic.

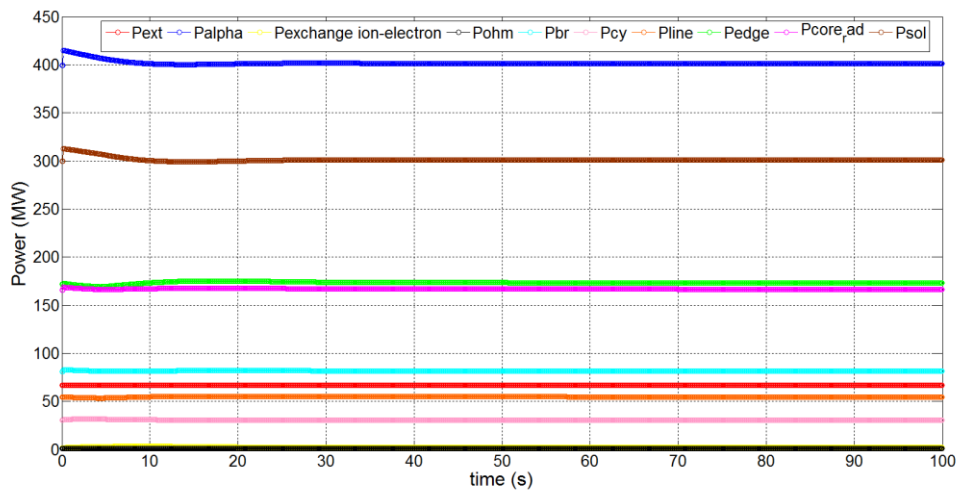


Figure 135: HCPB DEMO1 Occasional confinement time improvement x10 Powers graphic.

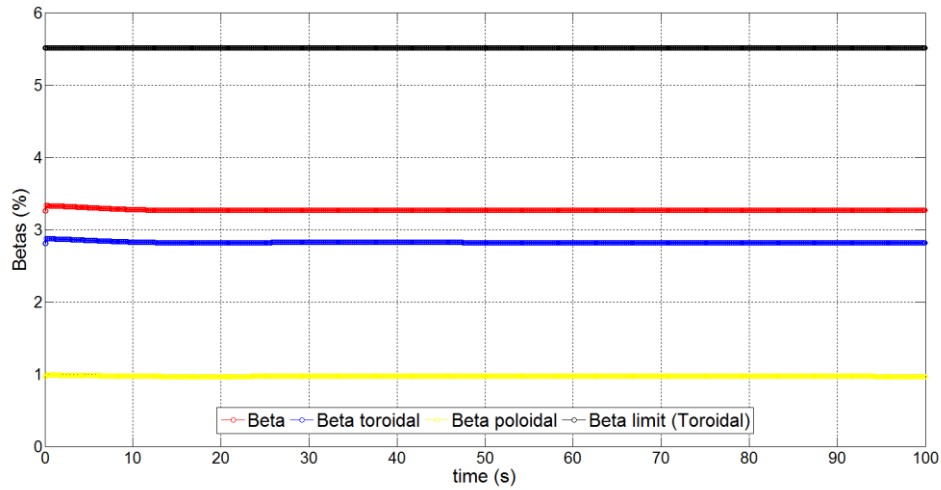


Figure 136: HCPB DEMO1 Occasional confinement time improvement x10 Betas graphic.

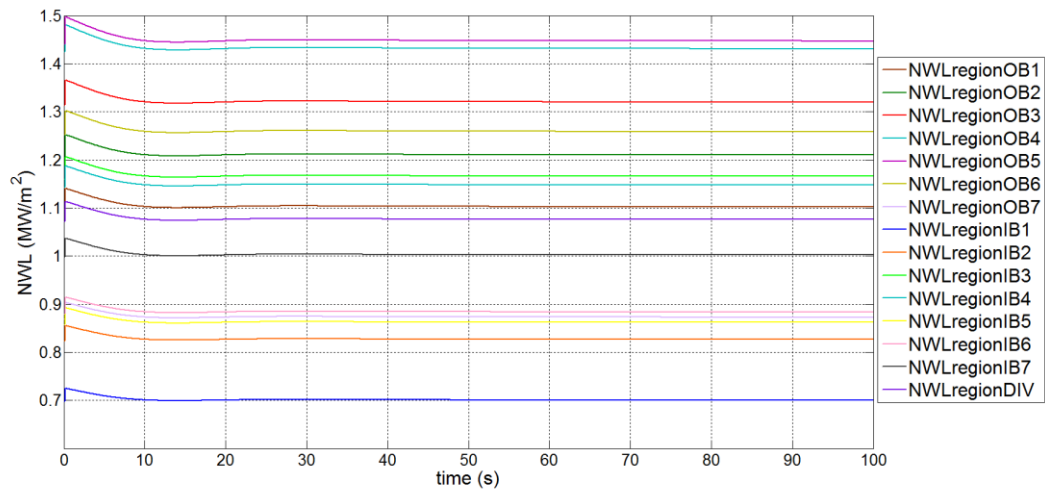


Figure 137: HCPB DEMO1 Occasional confinement time improvement x10 NWL graphic.

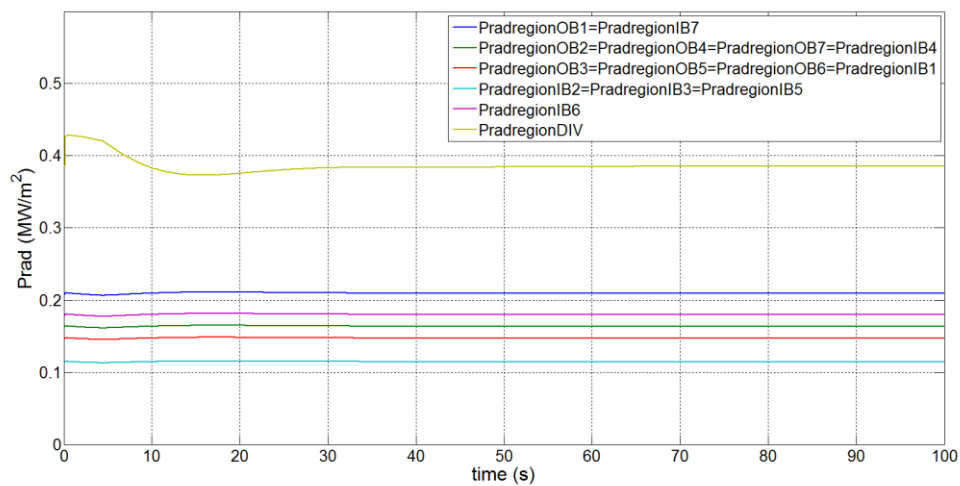


Figure 138: HCPB DEMO1 Occasional confinement time improvement x10 P<sub>rad</sub> graphic.

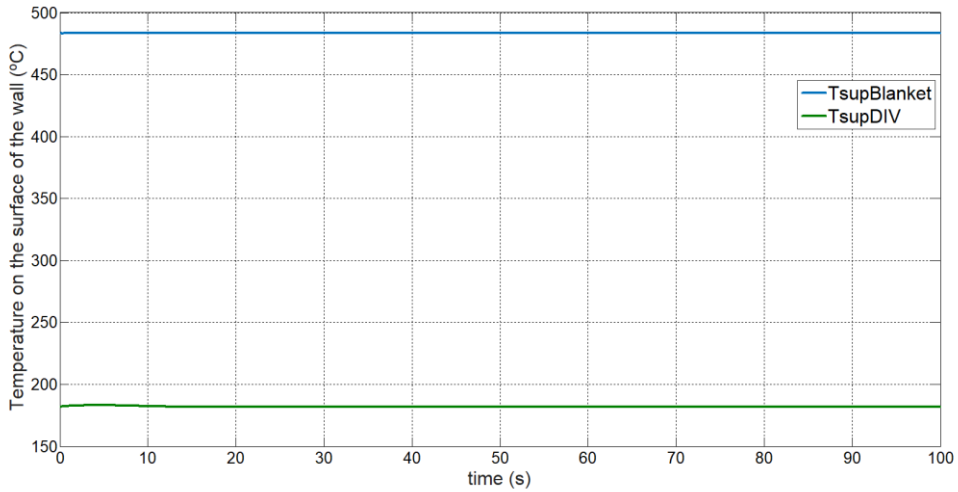


Figure 139: HCPB DEMO1 Occasional confinement time improvement x10 Temperature on the surface of the blanket and divertor wall graphic.

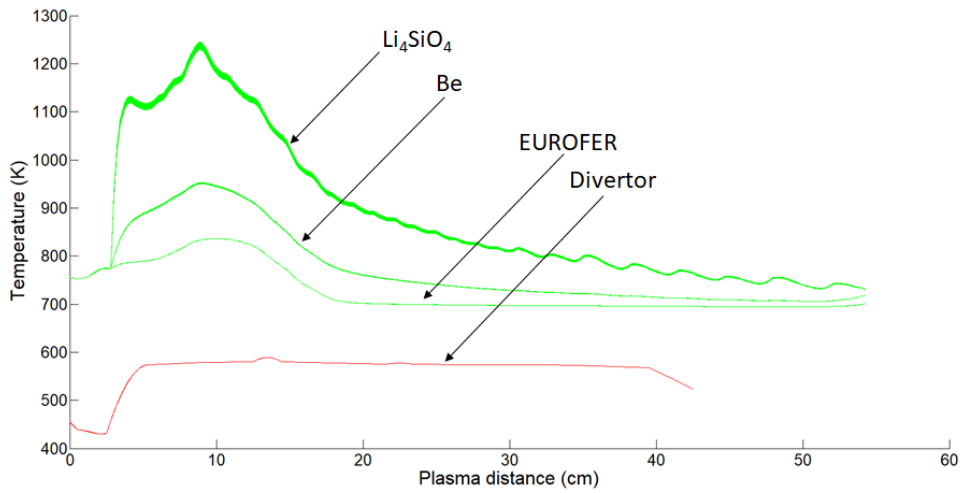


Figure 140: HCPB DEMO1 Occasional confinement time improvement x10 evolution of the BB and divertor temperature graphic.

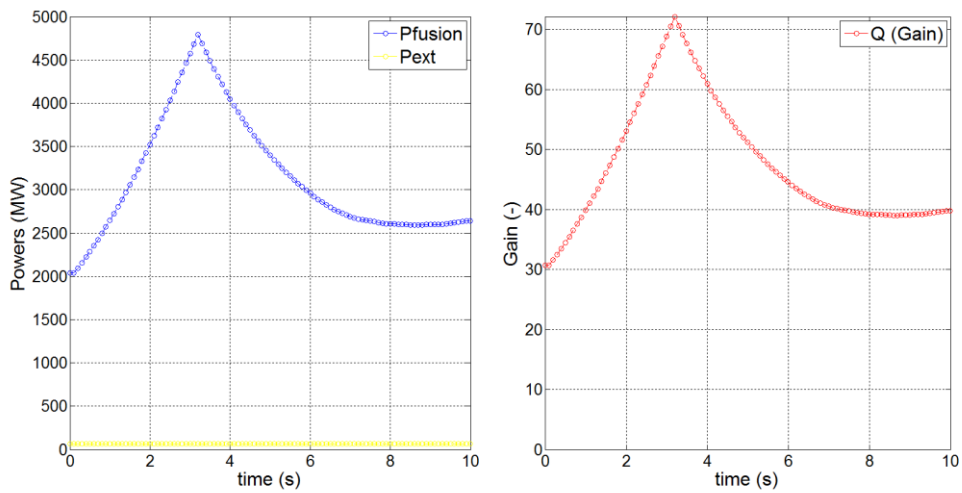


Figure 141: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s) P<sub>fus</sub> and gain graphic.



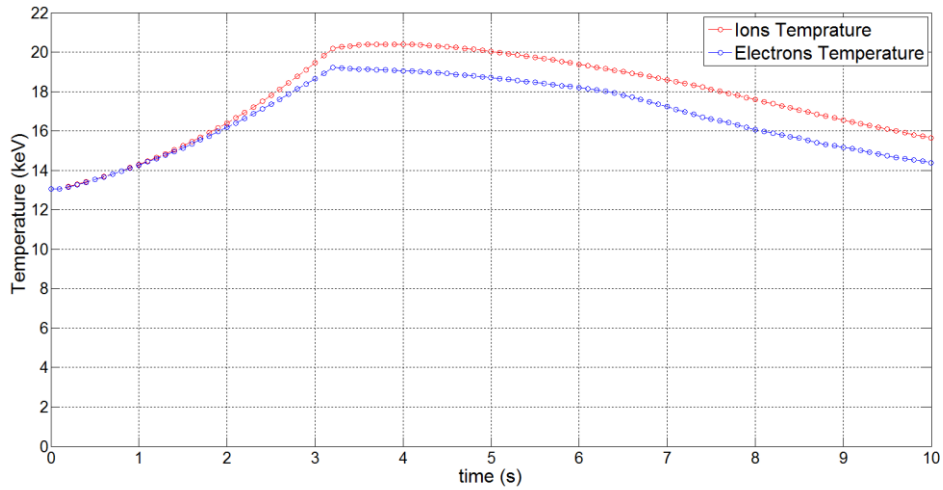


Figure 142: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s) Temperatures graphic.

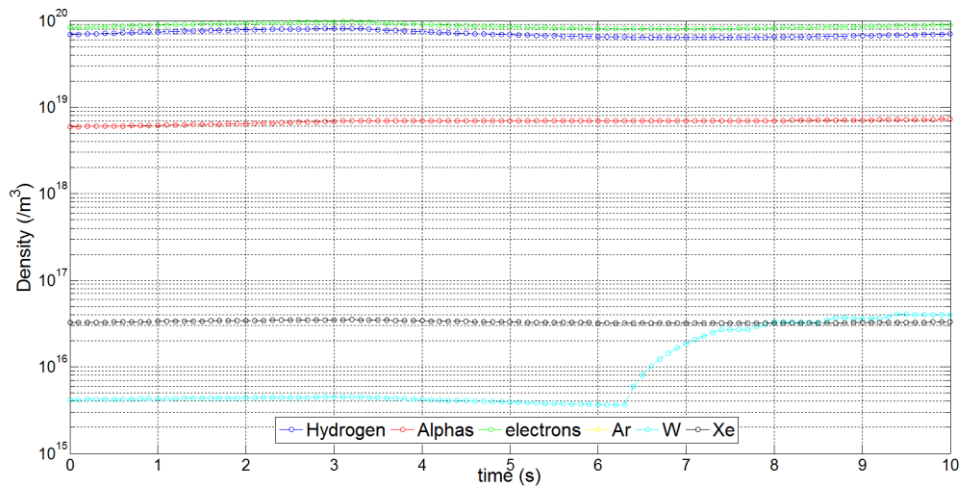


Figure 143: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s) Densities graphic.

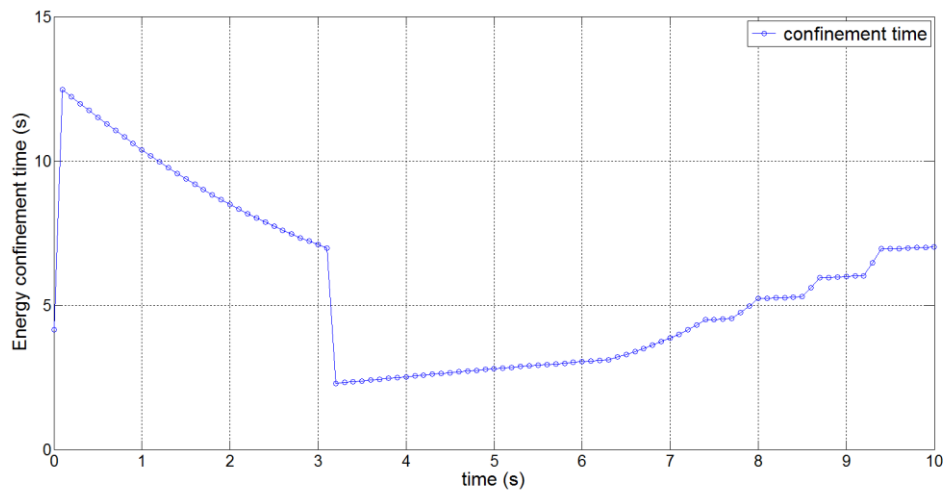


Figure 144: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s) Confinement time graphic.

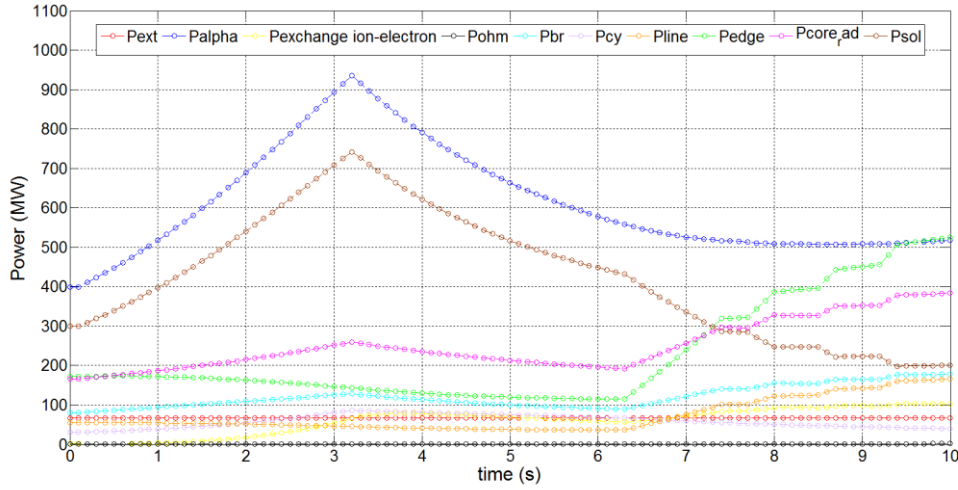


Figure 145: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s) Powers graphic.

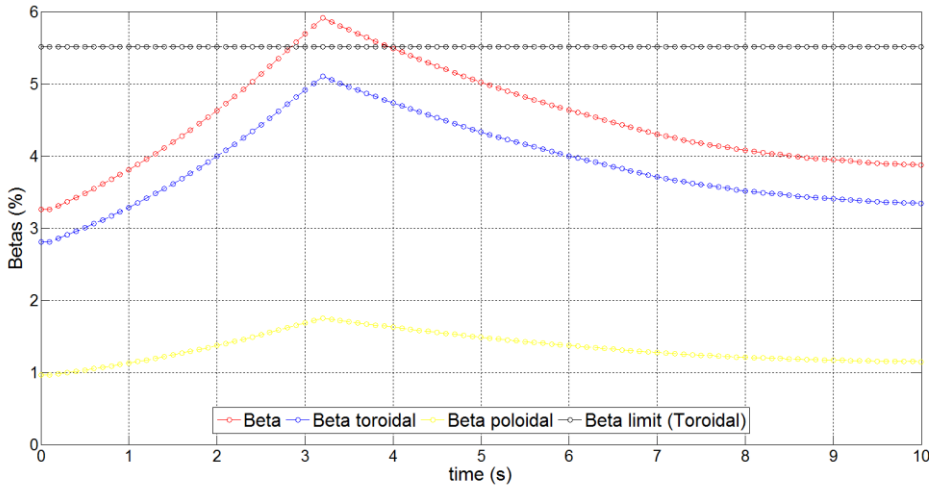


Figure 146: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s) Betas graphic.

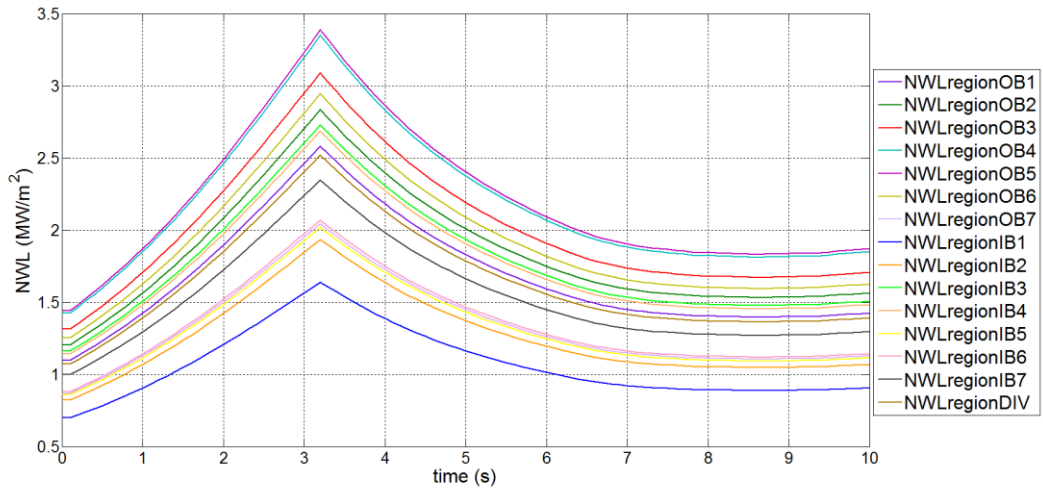


Figure 147: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s) NWL graphic.

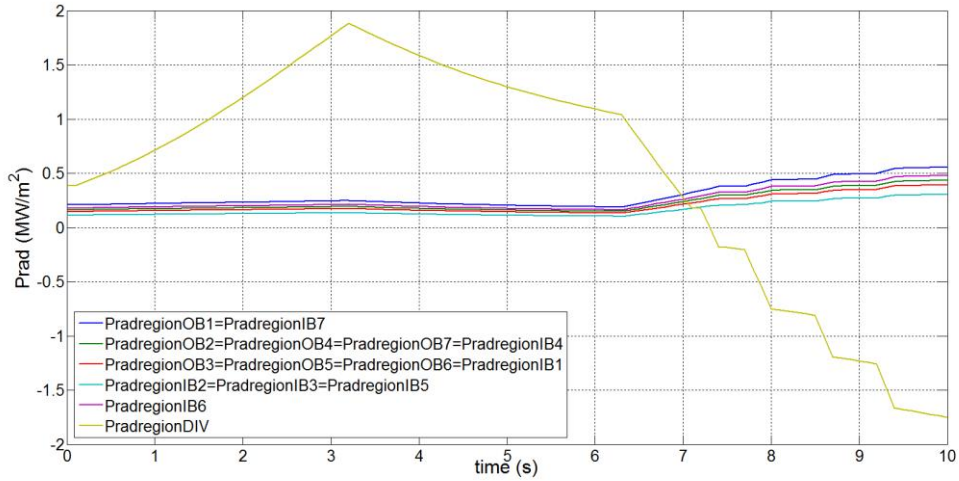


Figure 148: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s)  $P_{rad}$  graphic.

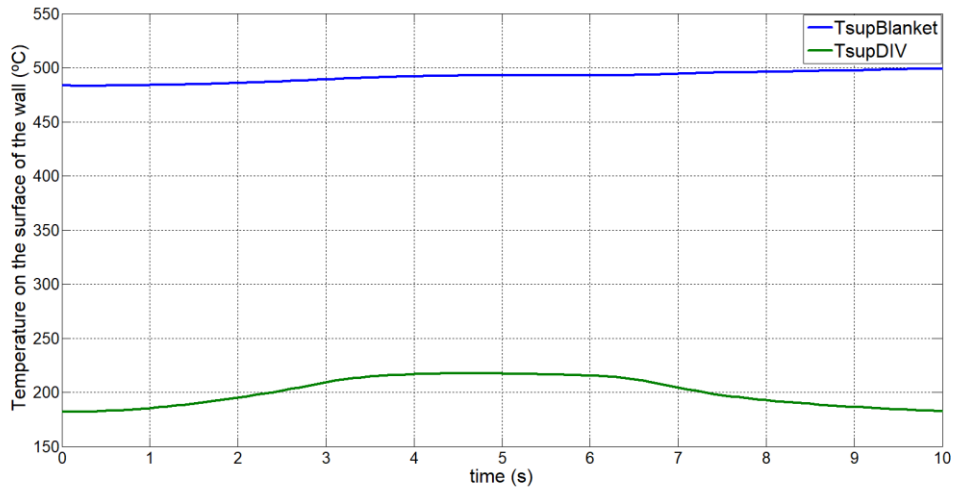


Figure 149: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s) Temperature on the surface of the blanket and divertor wall graphic.

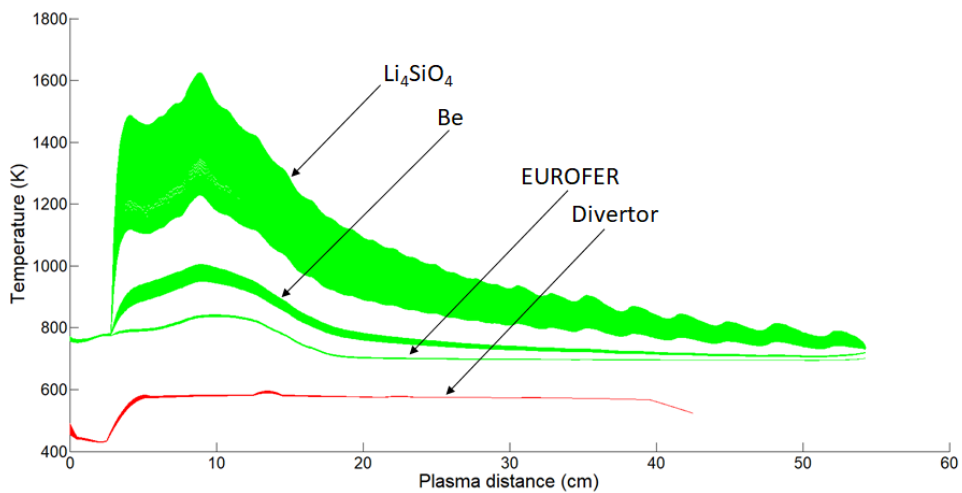


Figure 150: HCPB DEMO1 Occasional confinement time improvement x3 (during 3s) evolution of the BB and divertor temperature graphic.

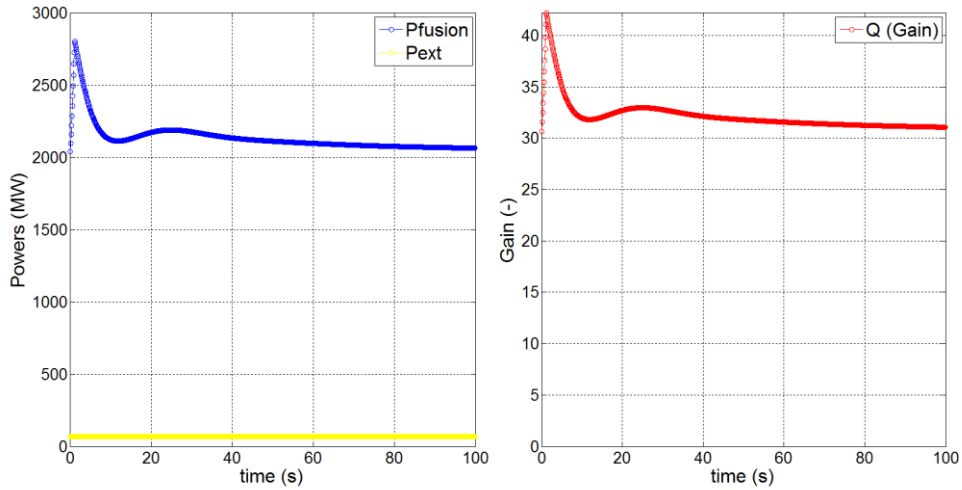


Figure 151: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s)  $P_{fus}$  and gain graphic.

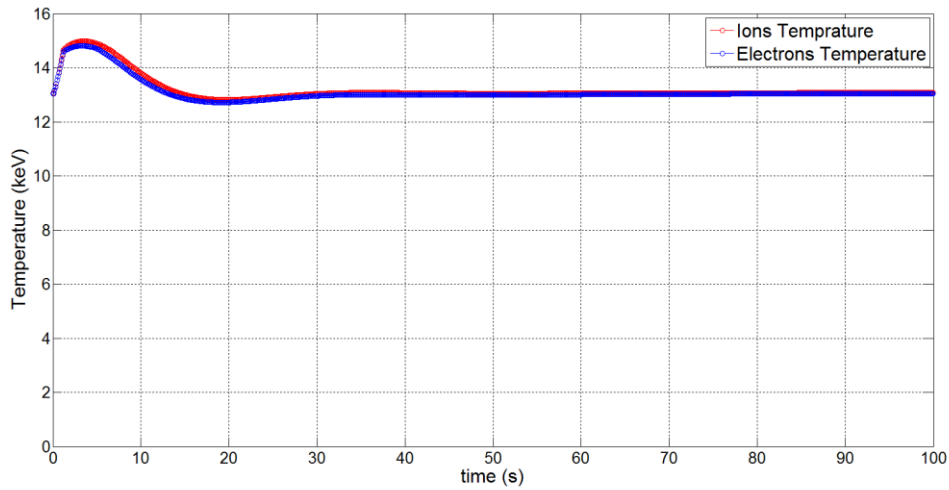


Figure 152: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s) Temperatures graphic.

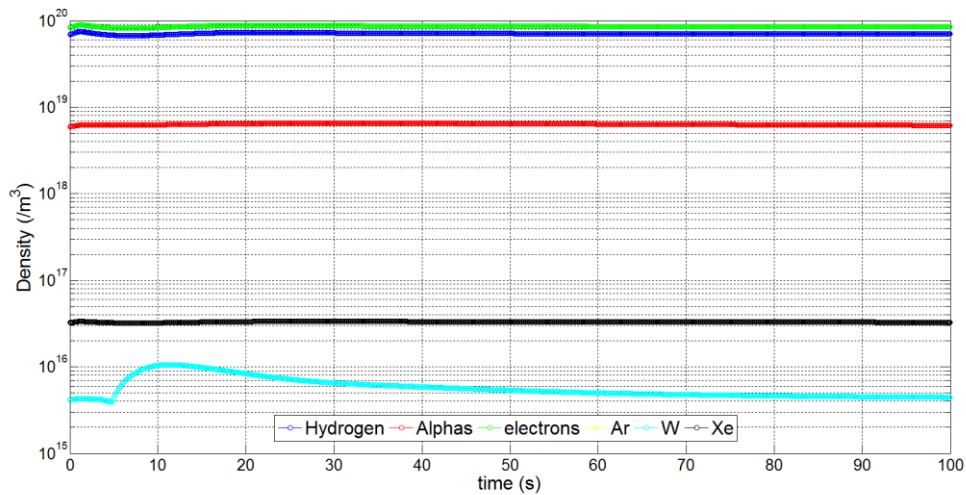


Figure 153: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s) Densities graphic.

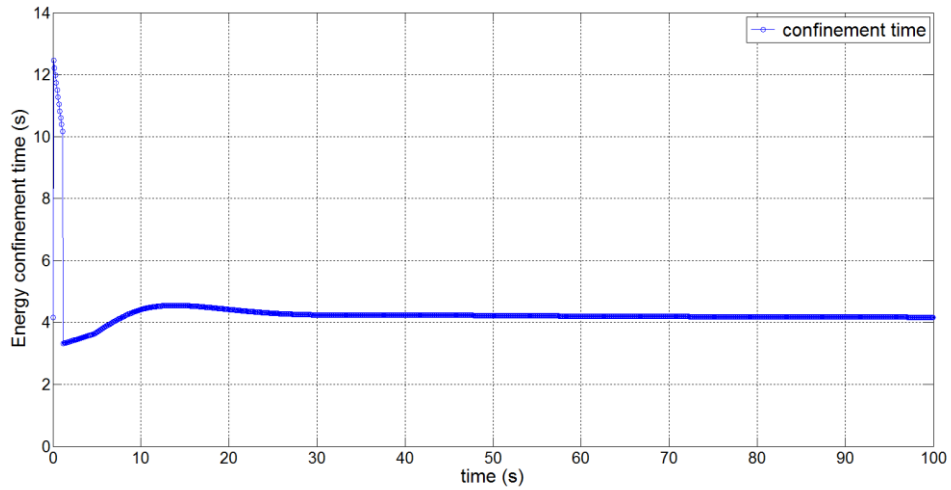


Figure 154: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s) Confinement time graphic.

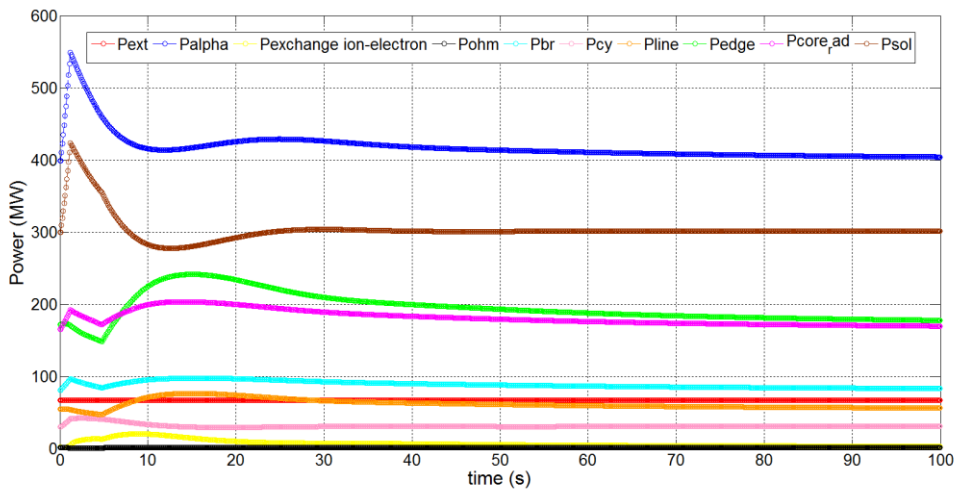


Figure 155: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s) Powers graphic.

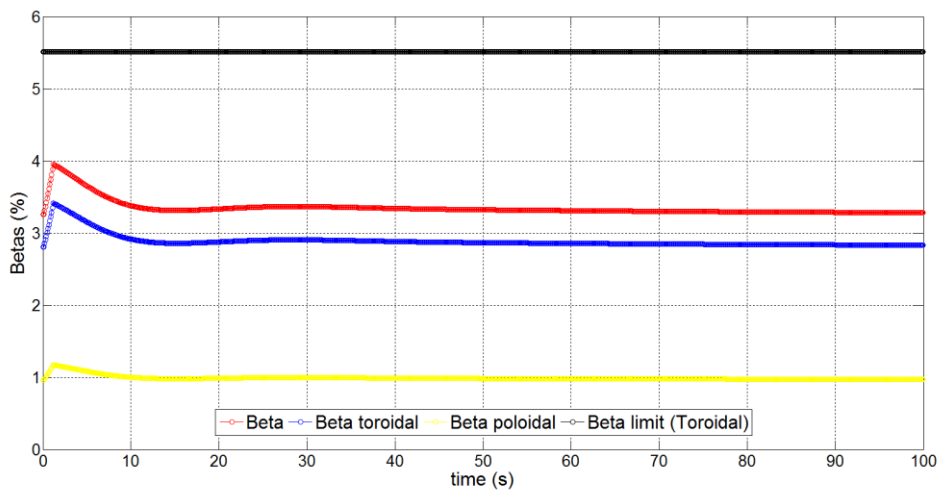


Figure 156: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s) Betas graphic.

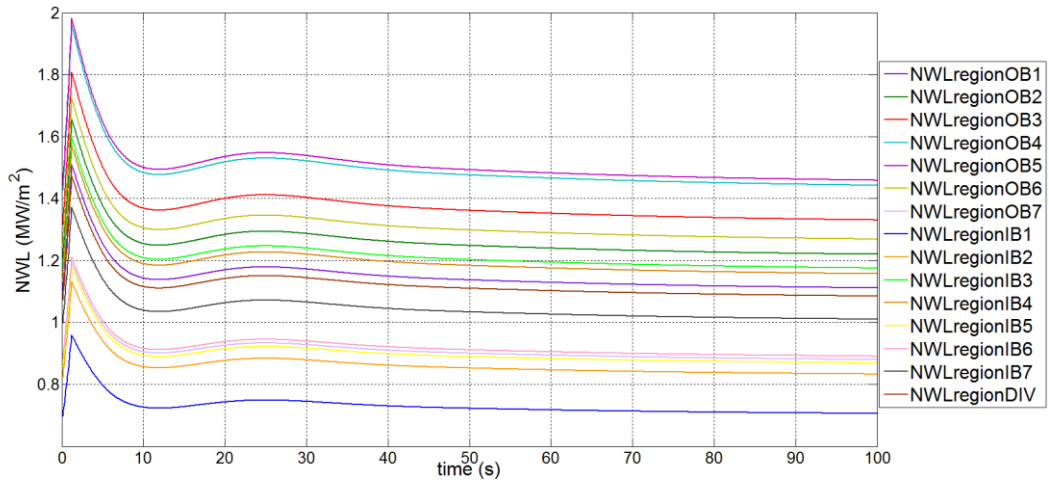


Figure 157: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s) NWL graphic.

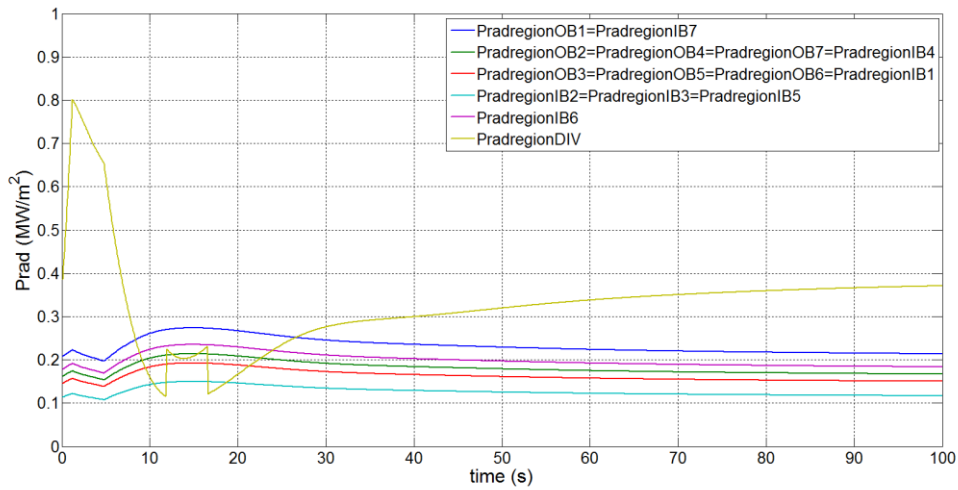


Figure 158: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s)  $P_{rad}$  graphic.

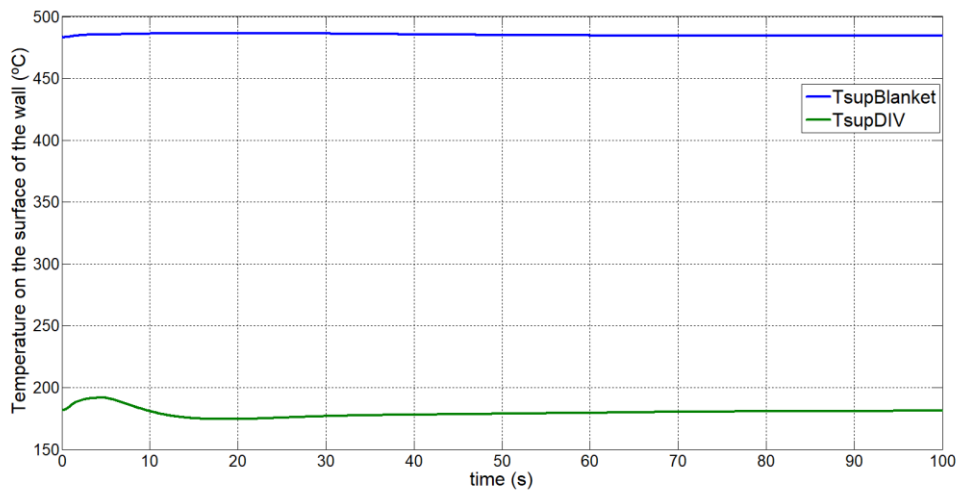


Figure 159: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s) Temperature on the surface of the blanket and divertor wall graphic.

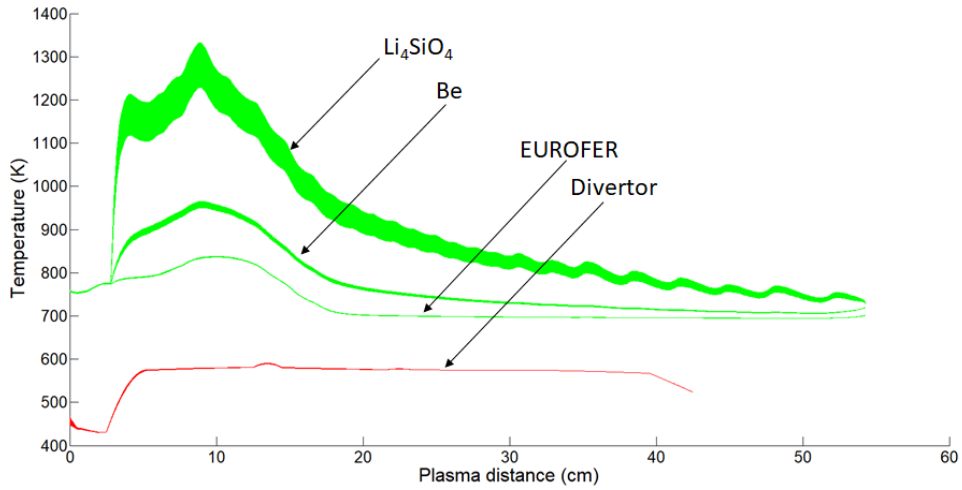


Figure 160: HCPB DEMO1 Occasional confinement time improvement x3 (during 1s) evolution of the BB and divertor temperature graphic.

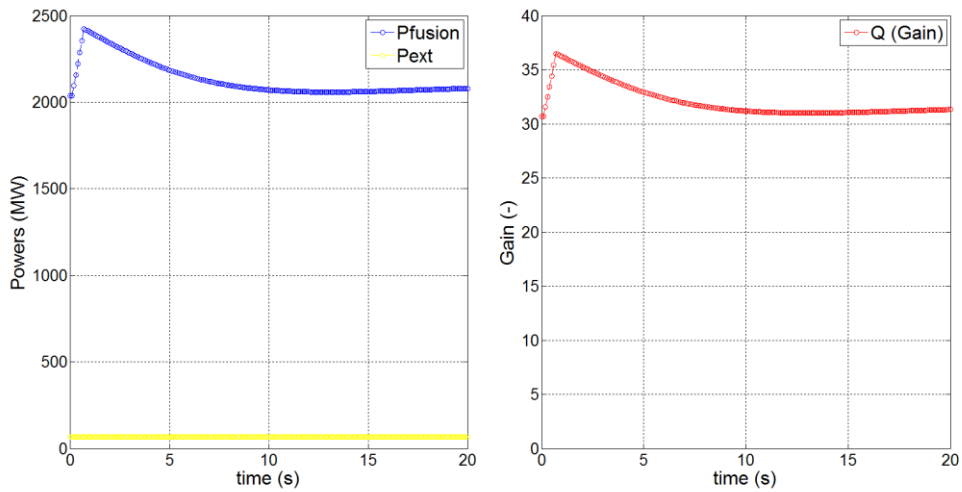


Figure 161: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s)  $P_{\text{fus}}$  and gain graphic.

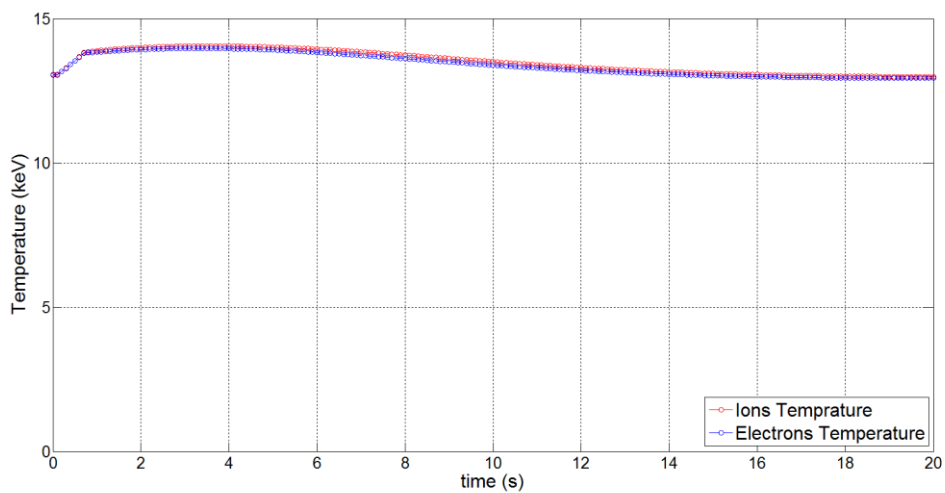


Figure 162: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s) Temperatures graphic.

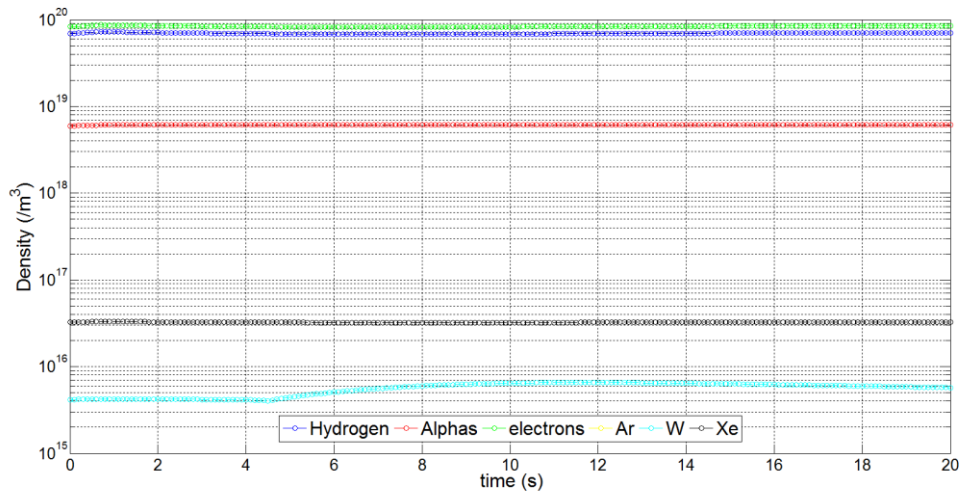


Figure 163: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s) Densities graphic.

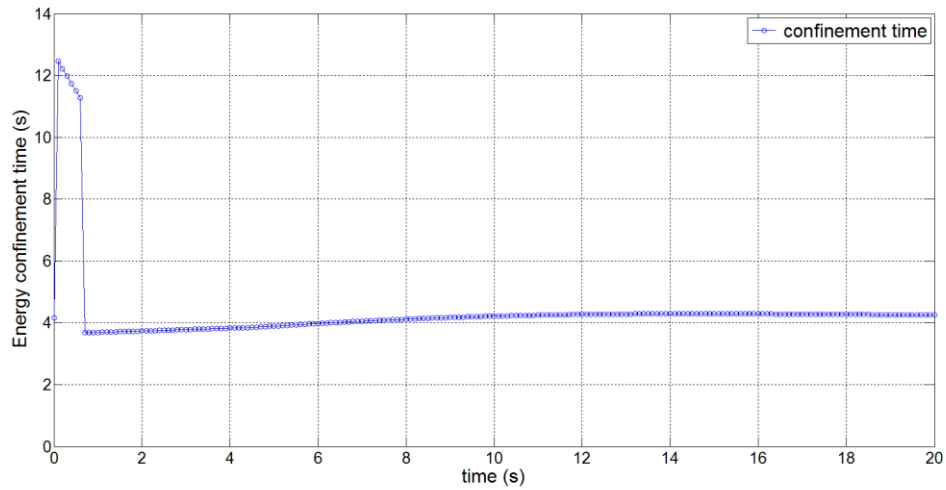


Figure 164: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s) confinement time graphic.

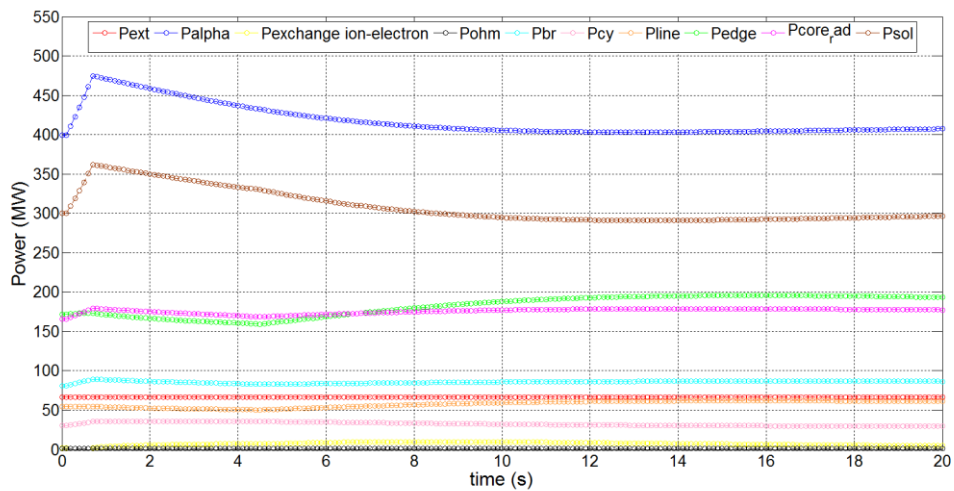


Figure 165: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s) Powers graphic.



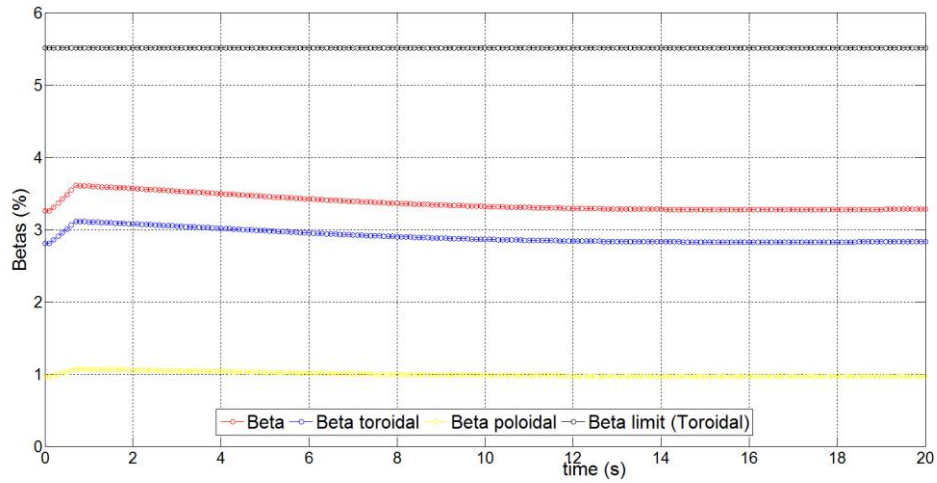


Figure 166: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s) Betas graphic.

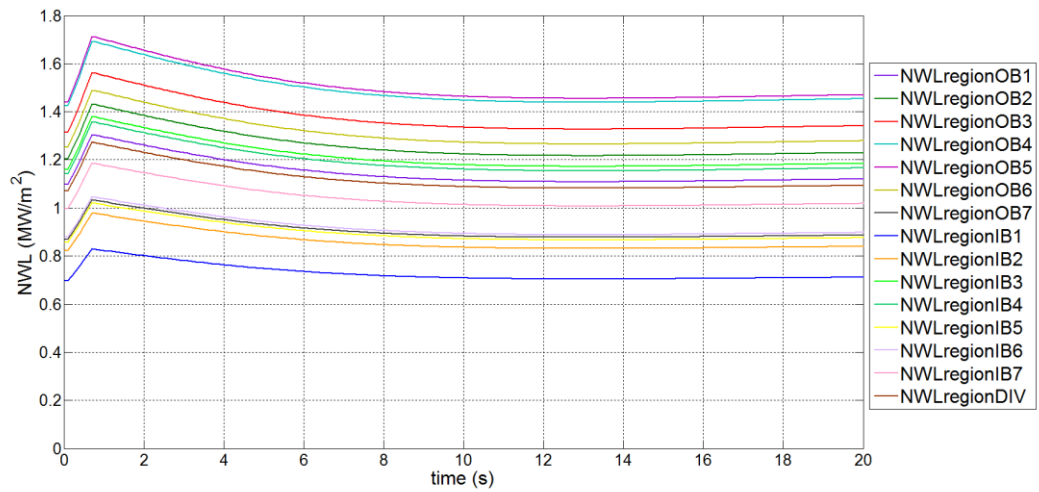


Figure 167: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s) NWL graphic.

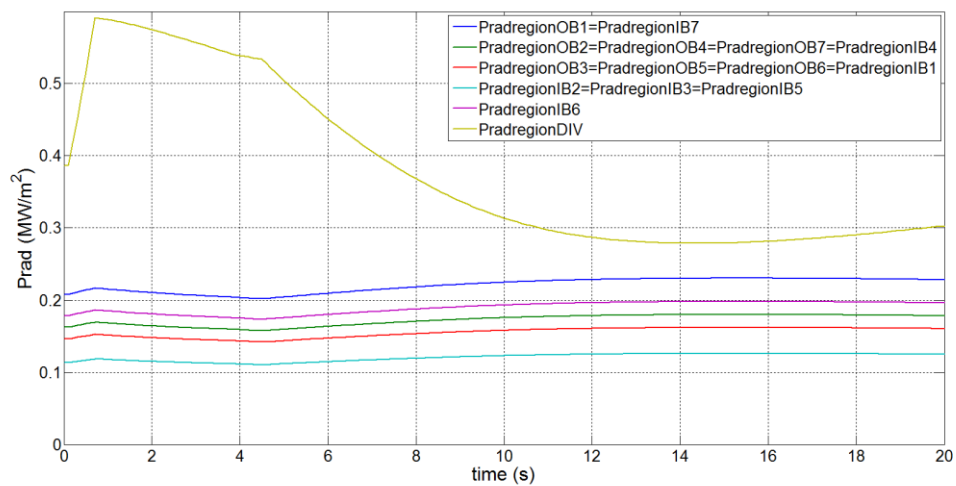


Figure 168: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s)  $P_{rad}$  graphic.

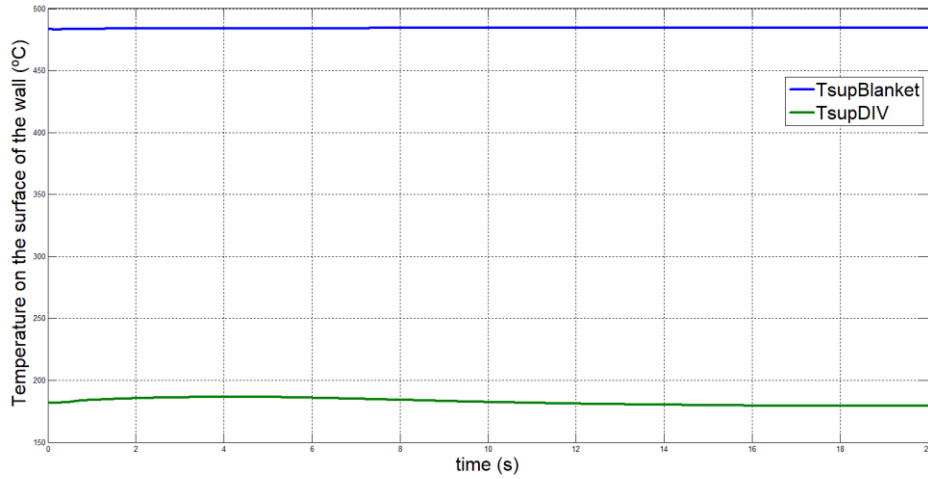


Figure 169: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s) Temperature on the surface of the blanket and divertor wall graphic.

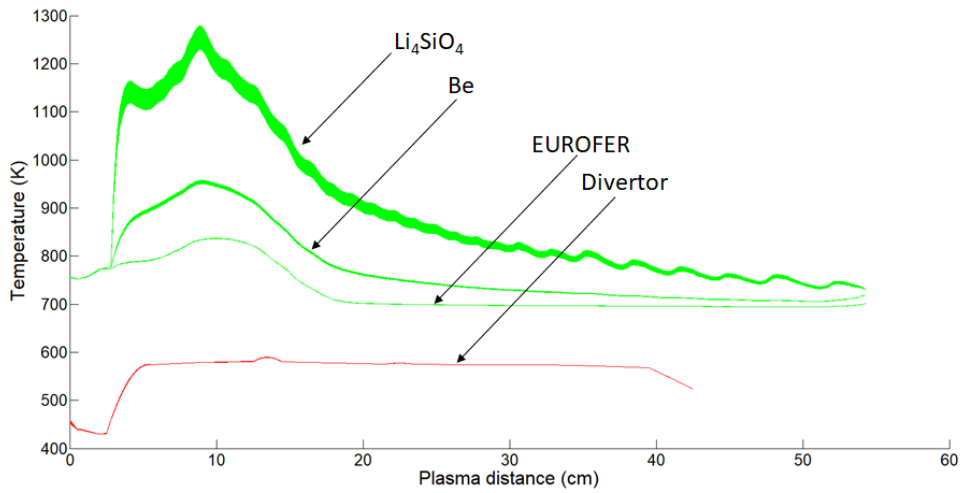


Figure 170: HCPB DEMO1 Occasional confinement time improvement x3 (during 0.5s) evolution of the BB and divertor temperature graphic.

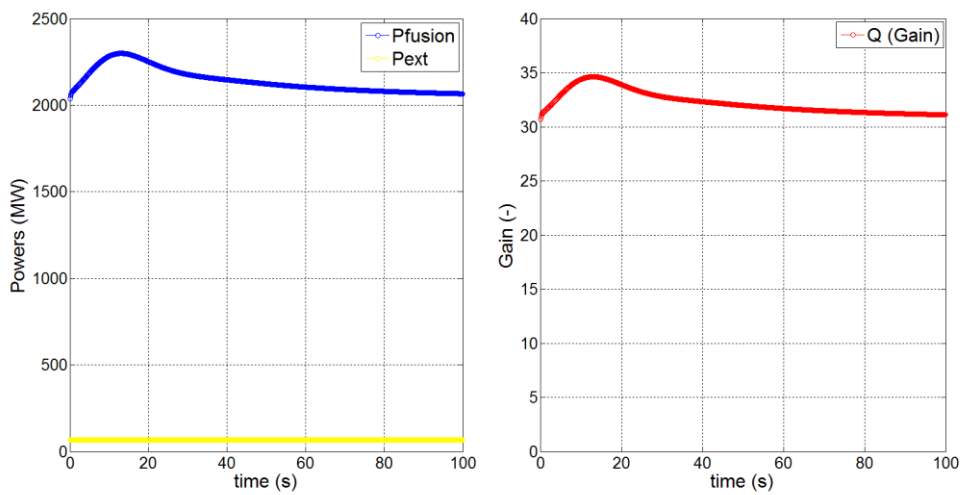


Figure 171: HCPB DEMO1 Punctual impurities entrance x1.5 P<sub>fus</sub> and gain graphic.

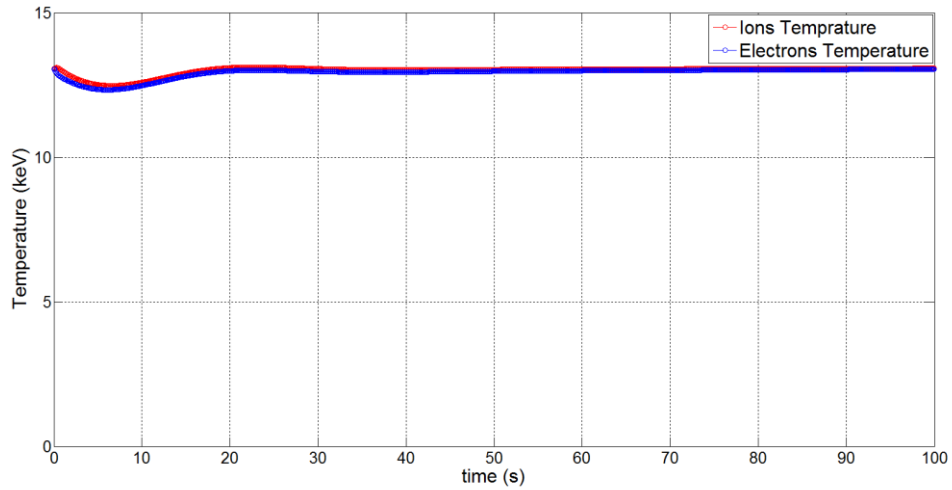


Figure 172: HCPB DEMO1 Punctual impurities entrance x1.5 Temperatures graphic.

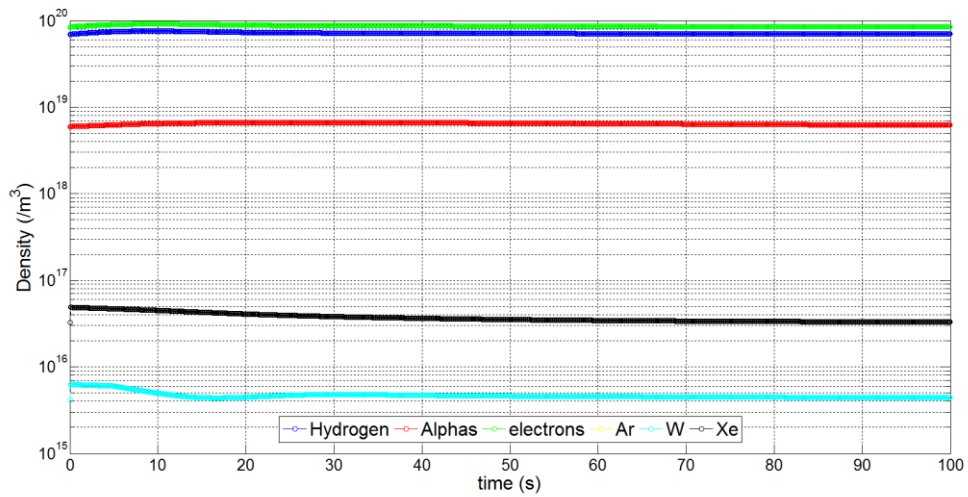


Figure 173: HCPB DEMO1 Punctual impurities entrance x1.5 Densities graphic.

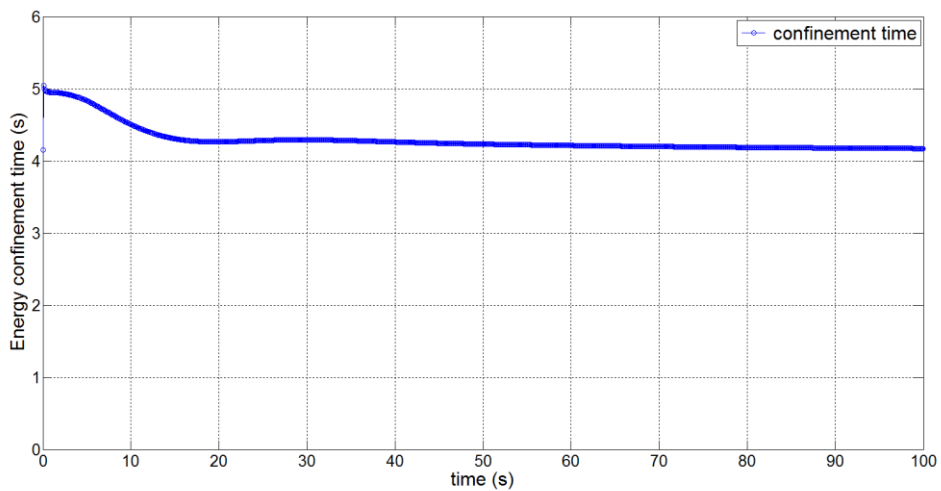


Figure 174: HCPB DEMO1 Punctual impurities entrance x1.5 Confinement time graphic.

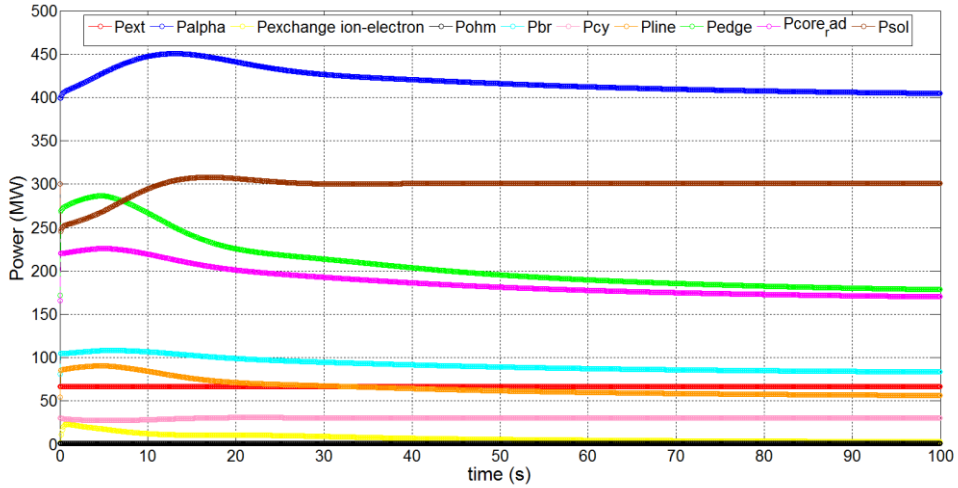


Figure 175: HCPB DEMO1 Punctual impurities entrance x1.5 Powers graphic.

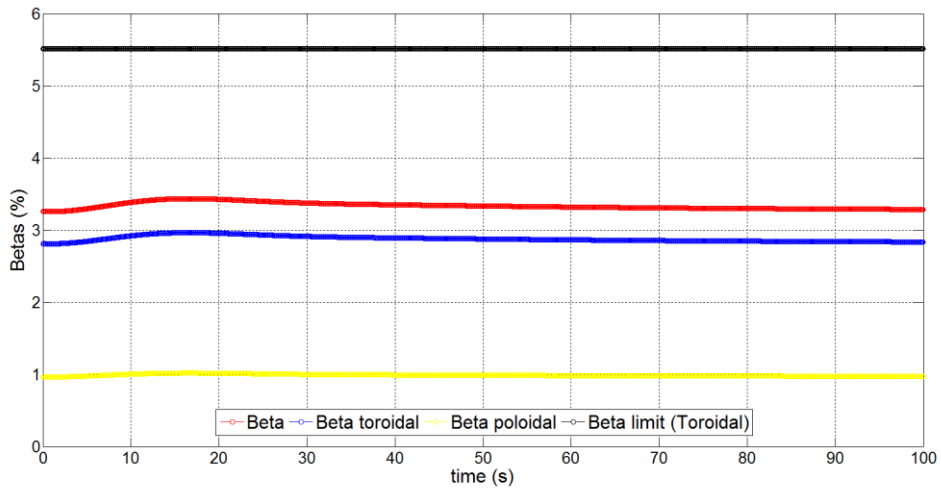


Figure 176: HCPB DEMO1 Punctual impurities entrance x1.5 Betas graphic.

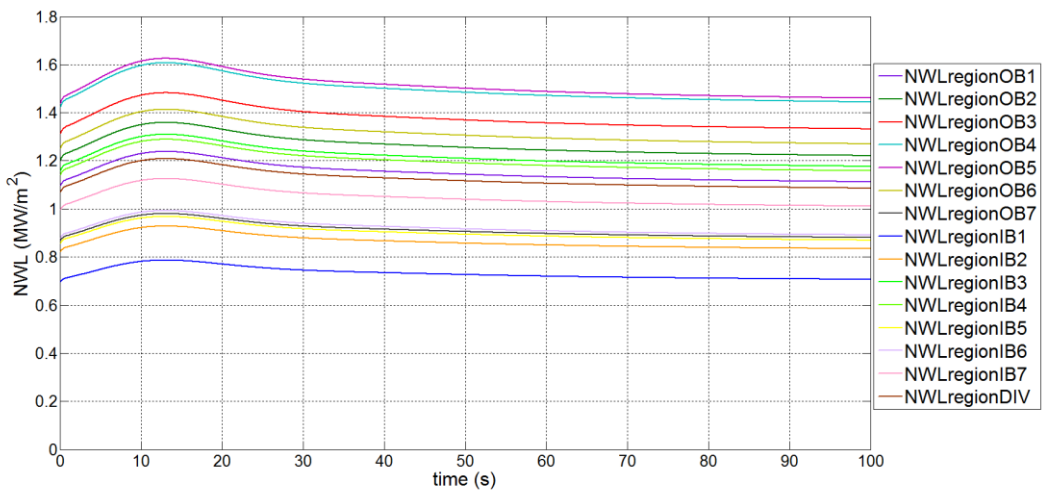


Figure 177: HCPB DEMO1 Punctual impurities entrance x1.5 NWL graphic.

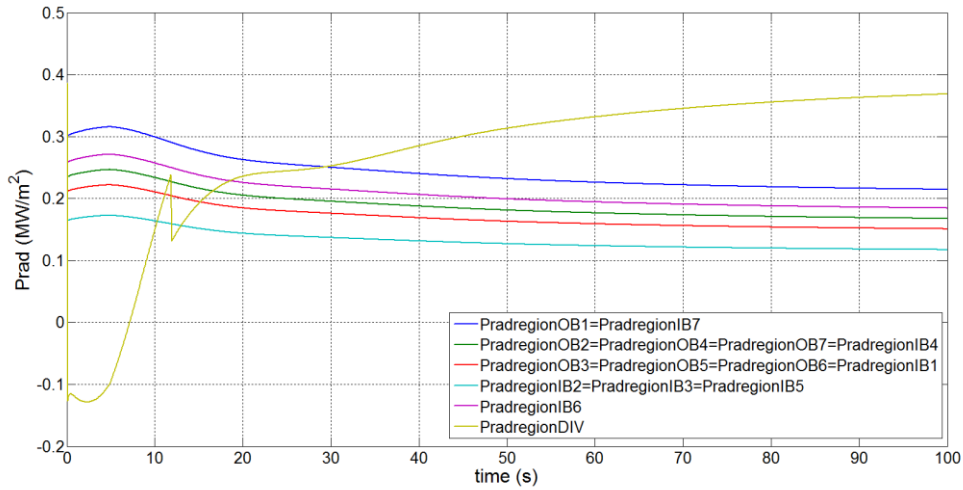


Figure 178: HCPB DEMO1 Punctual impurities entrance x1.5  $P_{rad}$  graphic.

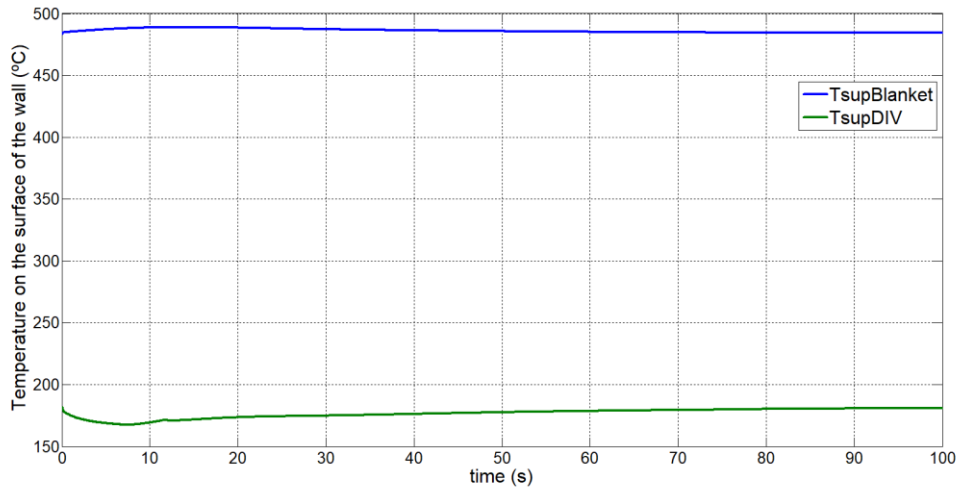


Figure 179: HCPB DEMO1 Punctual impurities entrance x1.5 Temperature on the surface of the blanket and divertor wall graphic.

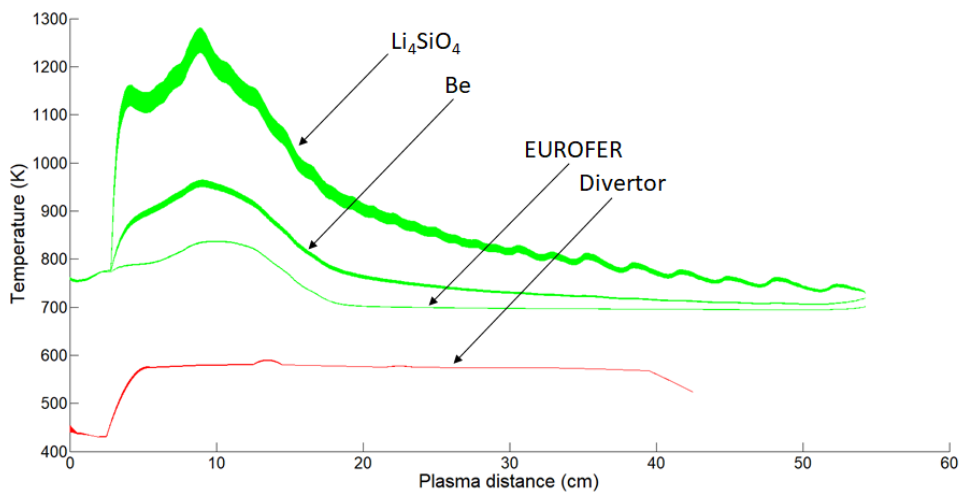


Figure 180: HCPB DEMO1 Punctual impurities entrance x1.5 evolution of the BB and divertor temperature graphic.

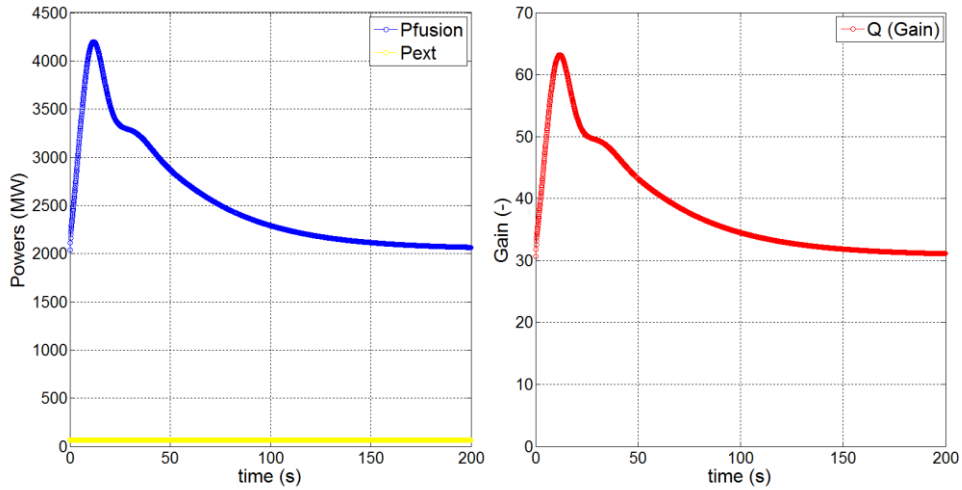


Figure 181: HCPB DEMO1 Punctual impurities entrance x2.9  $P_{fus}$  and gain graphic.

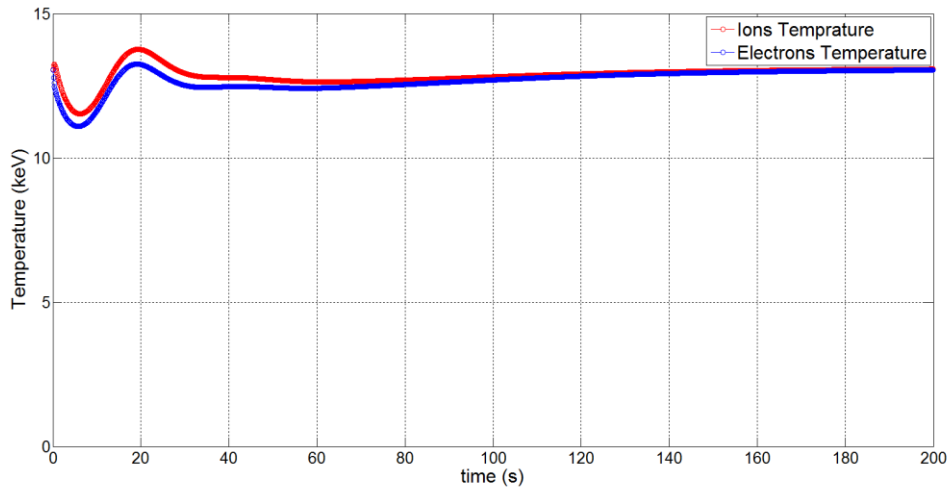


Figure 182: HCPB DEMO1 Punctual impurities entrance x2.9 Temperatures graphic.

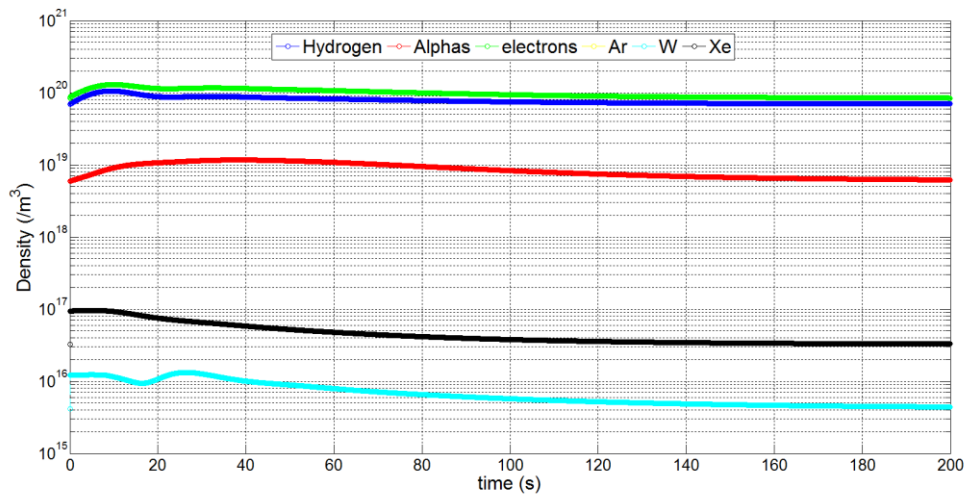


Figure 183: HCPB DEMO1 Punctual impurities entrance x2.9 Densities graphic.

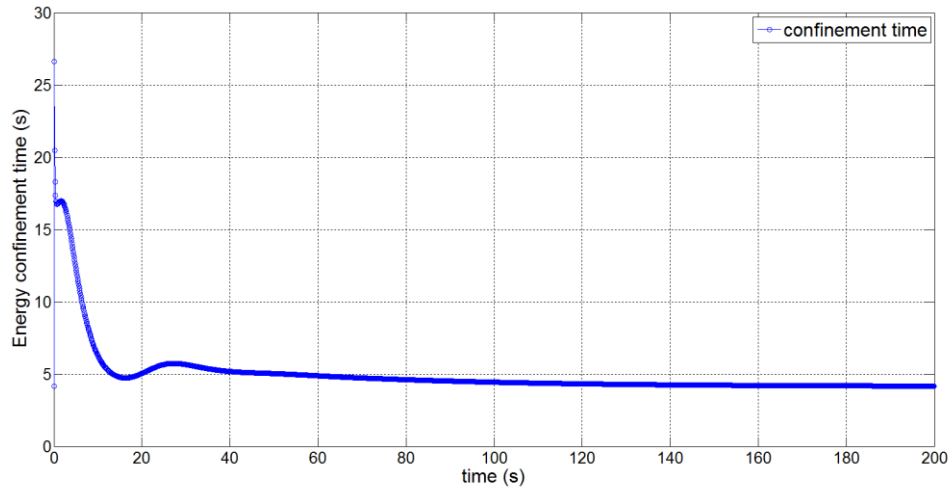


Figure 184: HCPB DEMO1 Punctual impurities entrance x2.9 Confinement time graphic.

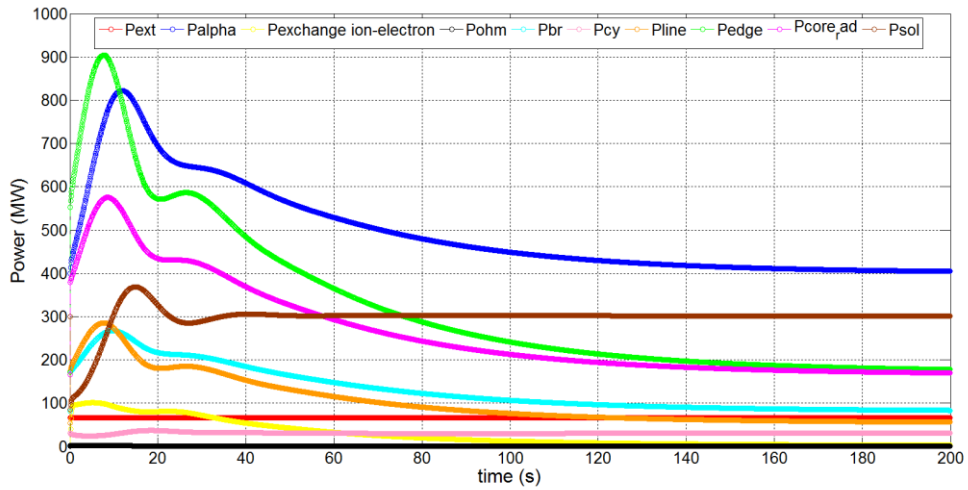


Figure 185: HCPB DEMO1 Punctual impurities entrance x2.9 Powers graphic.

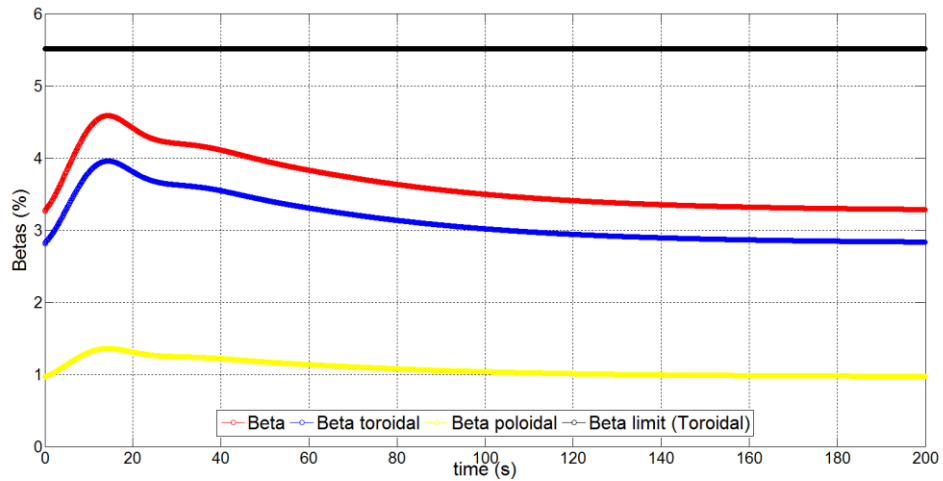


Figure 186: HCPB DEMO1 Punctual impurities entrance x2.9 Betas graphic.

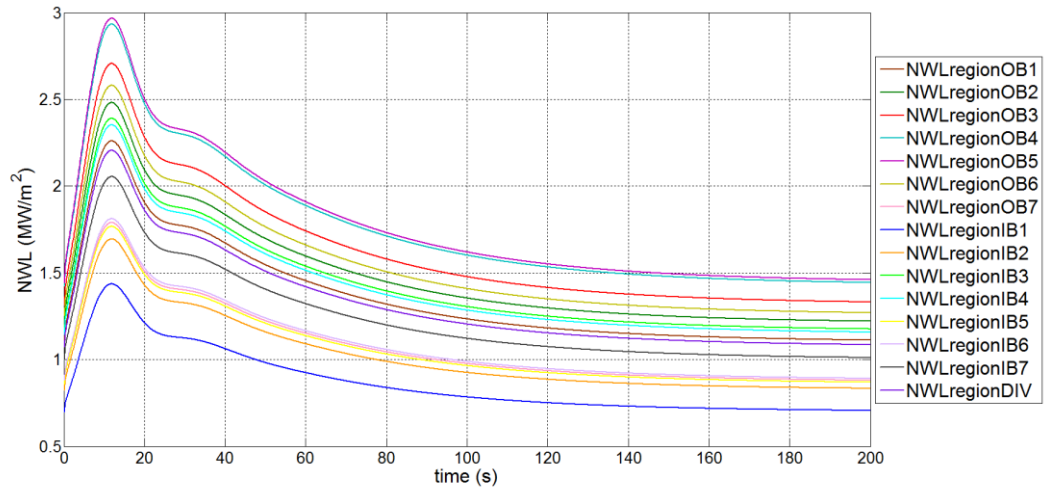


Figure 187: HCPB DEMO1 Punctual impurities entrance x2.9 NWL graphic.

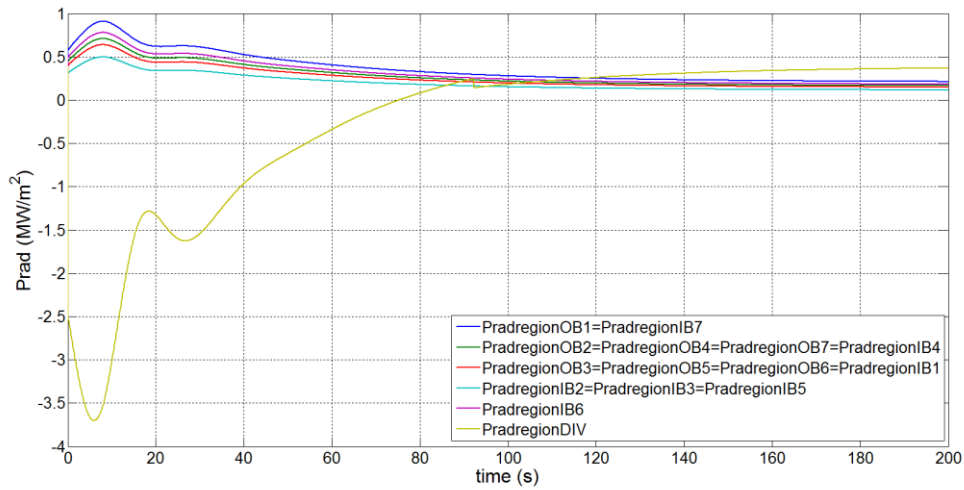


Figure 188: HCPB DEMO1 Punctual impurities entrance x2.9 Prad graphic.

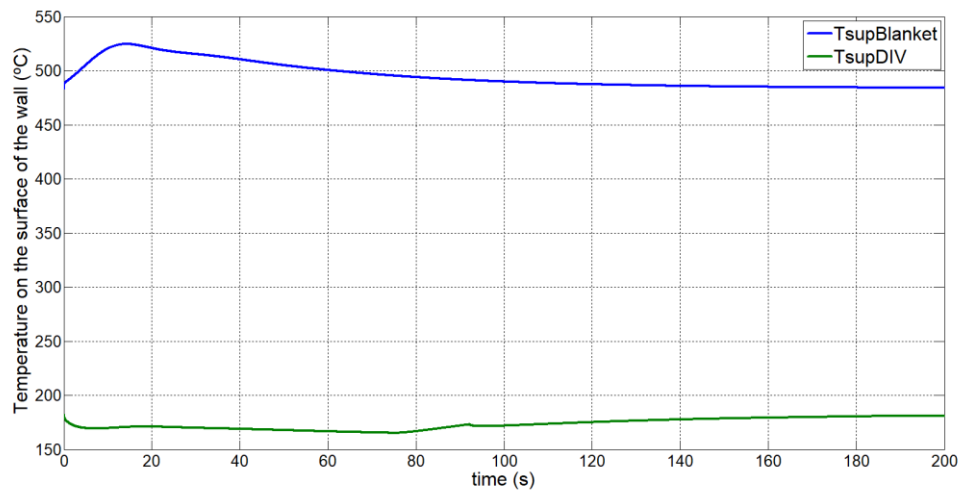


Figure 189: HCPB DEMO1 Punctual impurities entrance x2.9 Temperature on the surface of the blanket and divertor wall graphic.



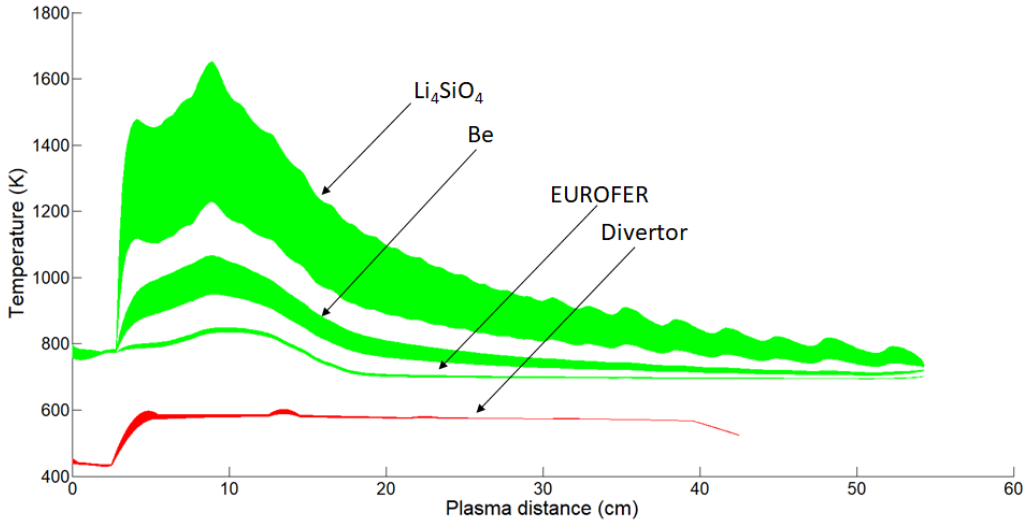


Figure 190: HCPB DEMO1 Punctual impurities entrance x2.9 evolution of the BB and divertor temperature graphic.

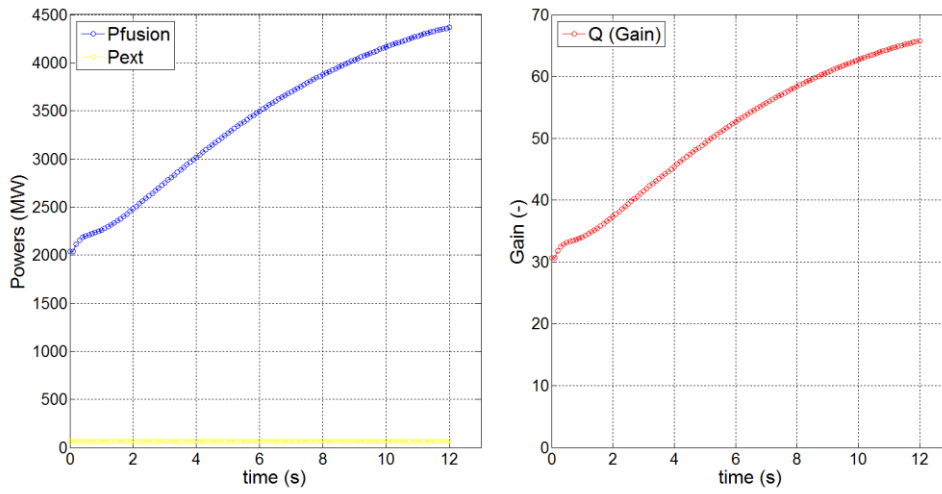


Figure 191: HCPB DEMO1 Punctual impurities entrance x3  $P_{fus}$  and gain graphic.

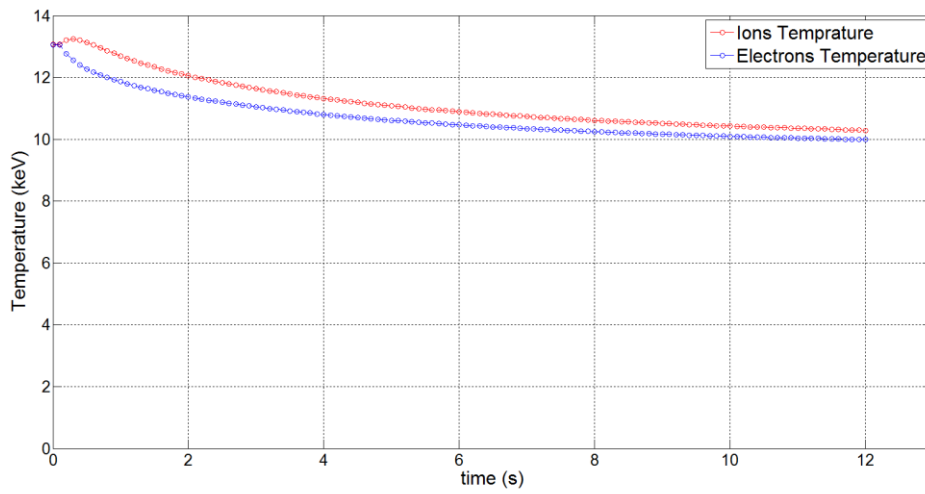


Figure 192: HCPB DEMO1 Punctual impurities entrance x3 Temperatures graphic.

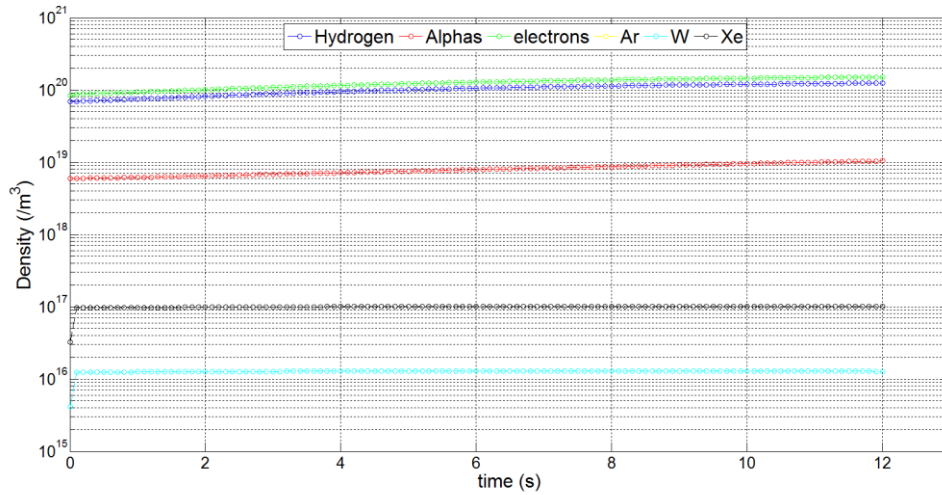


Figure 193: HCPB DEMO1 Punctual impurities entrance x3 Densities graphic.

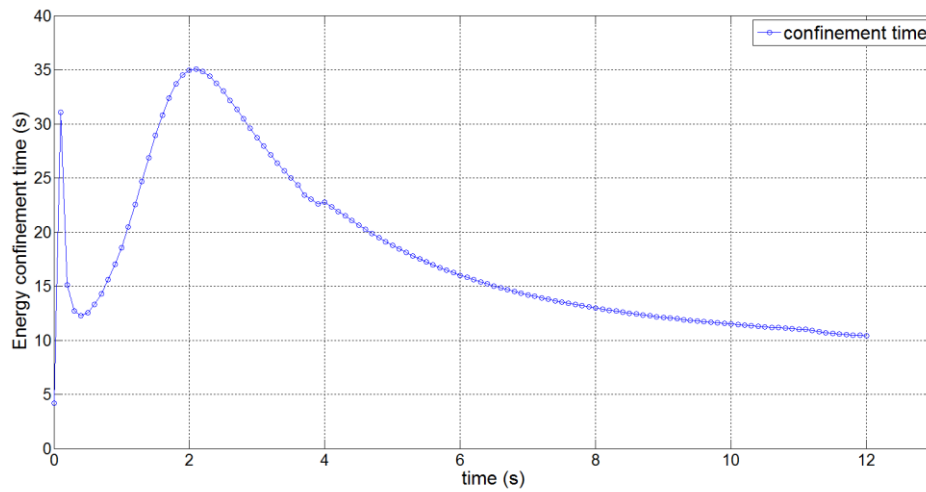


Figure 194: HCPB DEMO1 Punctual impurities entrance x3 Confinement time graphic.

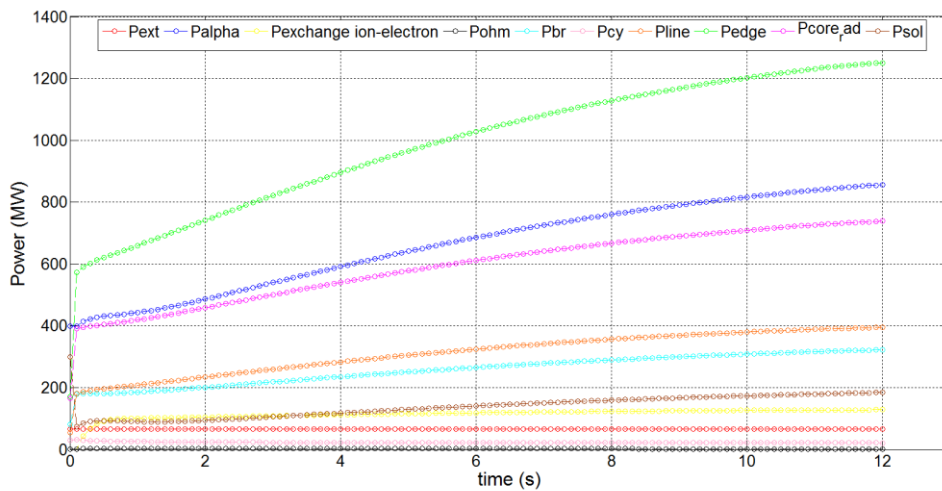


Figure 195: HCPB DEMO1 Punctual impurities entrance x3 Powers graphic.

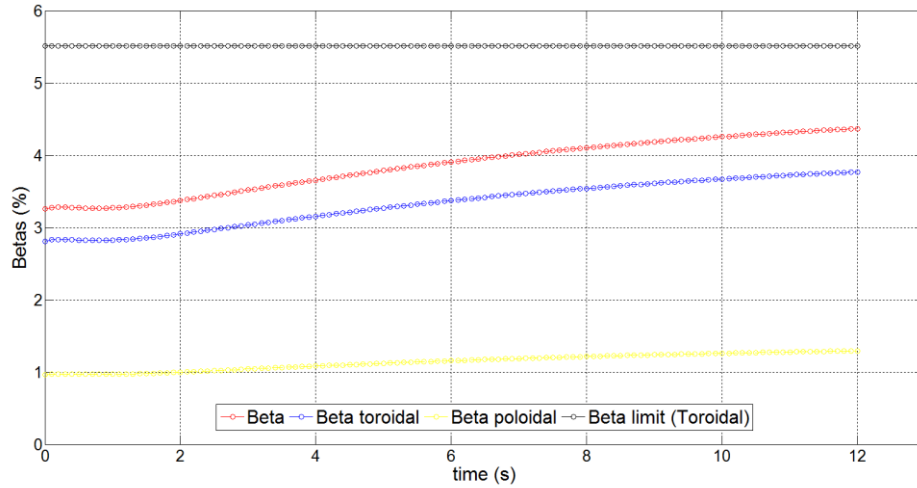


Figure 196: HCPB DEMO1 Punctual impurities entrance x3 Betas graphic.

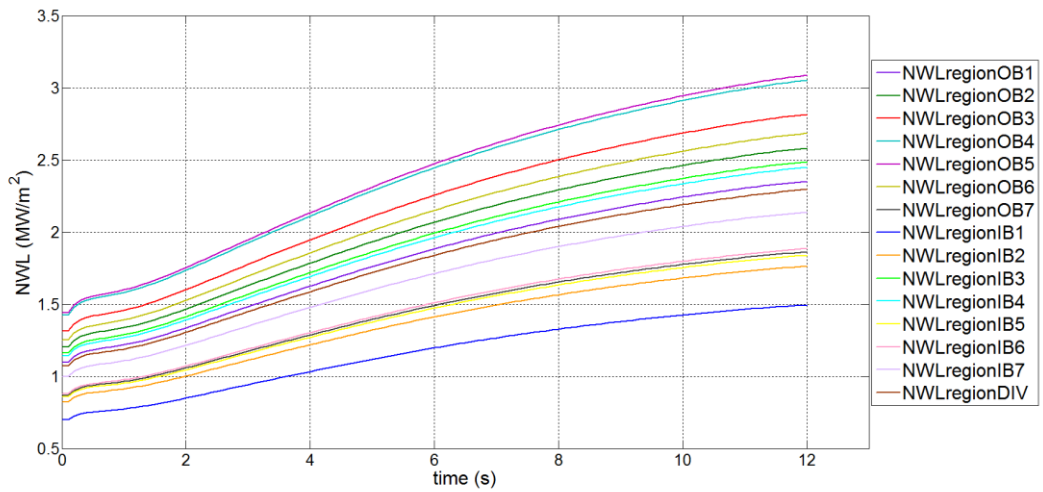


Figure 197: HCPB DEMO1 Punctual impurities entrance x3 NWL graphic.

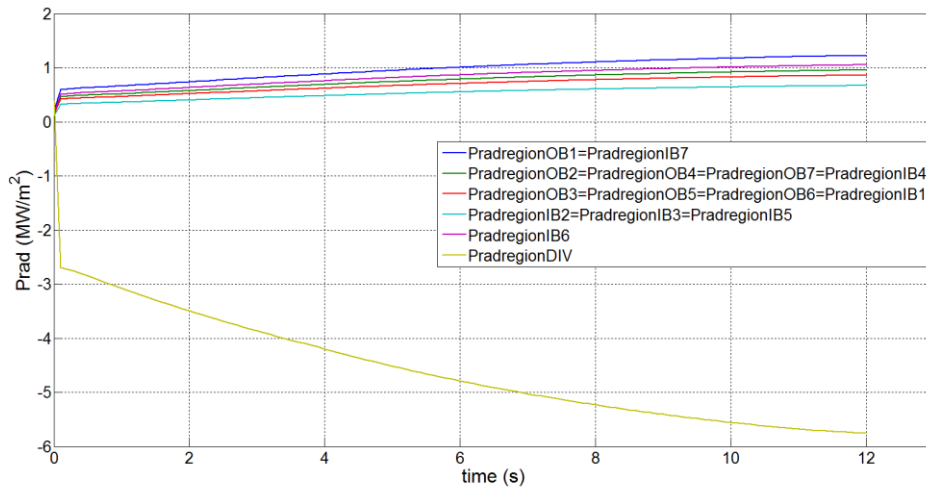


Figure 198: HCPB DEMO1 Punctual impurities entrance x3  $P_{rad}$  graphic.

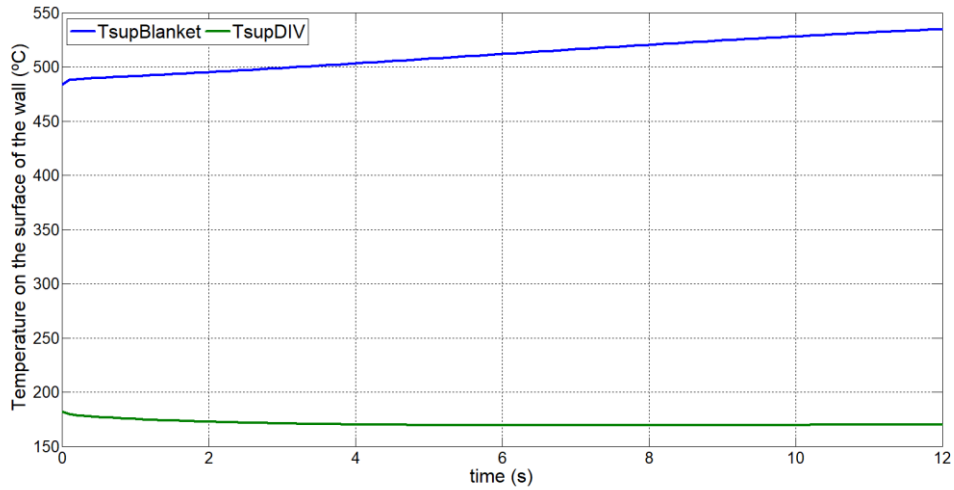


Figure 199: HCPB DEMO1 Punctual impurities entrance x3 Temperature on the surface of the blanket and divertor wall graphic.

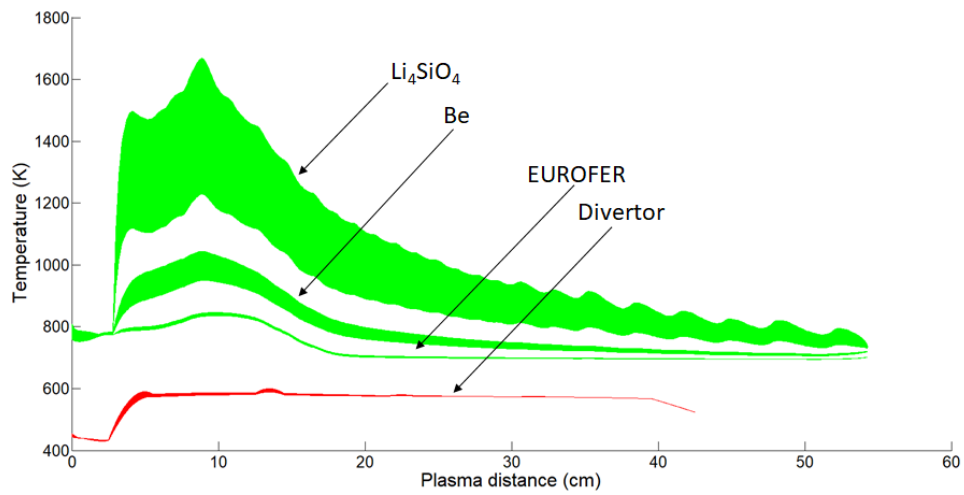


Figure 200: HCPB DEMO1 Punctual impurities entrance x3 evolution of the BB and divertor temperature graphic.

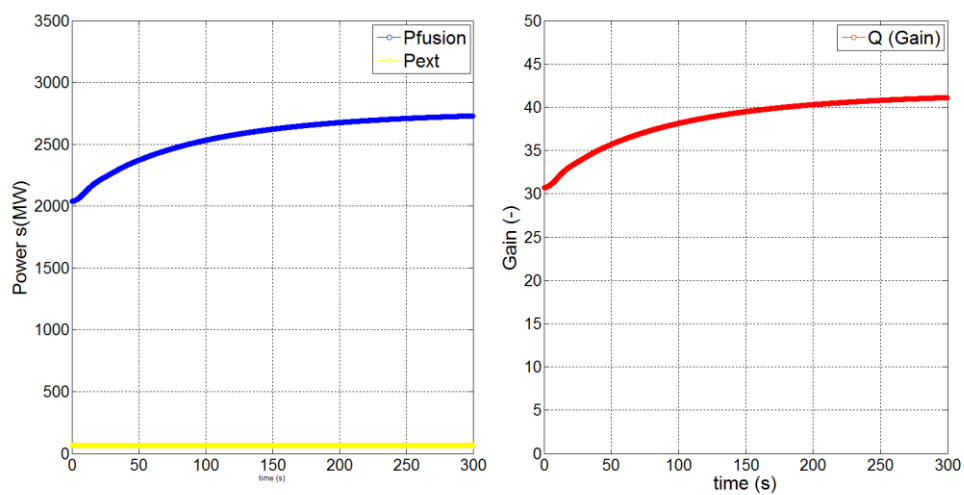


Figure 201: HCPB DEMO1 Tungsten permanent entrance x4 P<sub>fus</sub> and gain graphic.

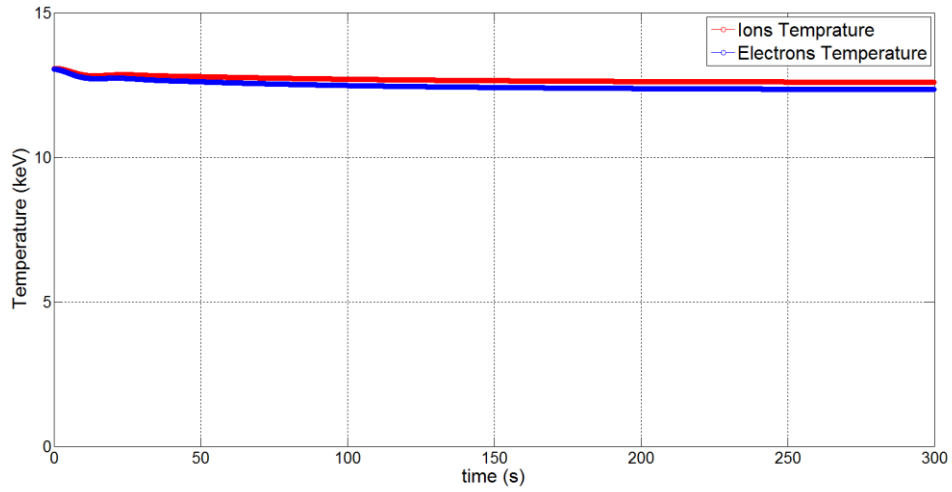


Figure 202: HCPB DEMO1 Tungsten permanent entrance x4 Temperatures graphic.

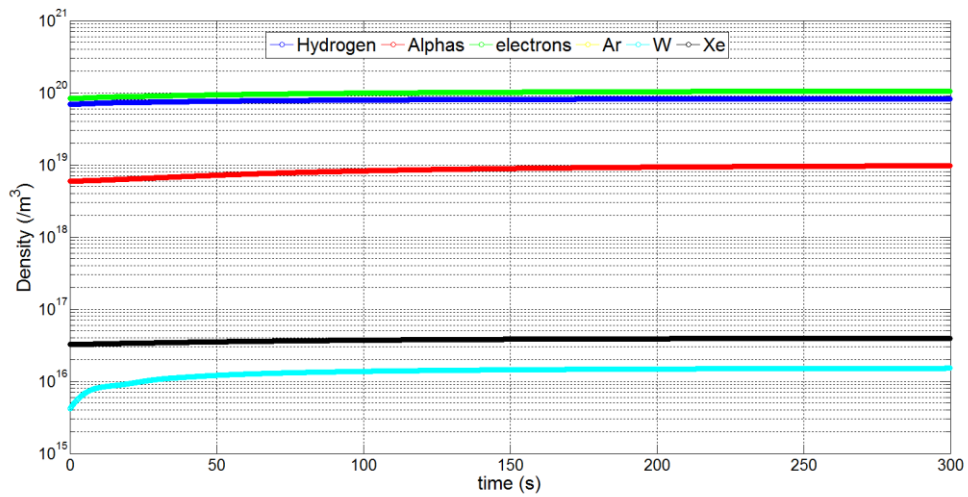


Figure 203: HCPB DEMO1 Tungsten permanent entrance x4 Densities graphic.

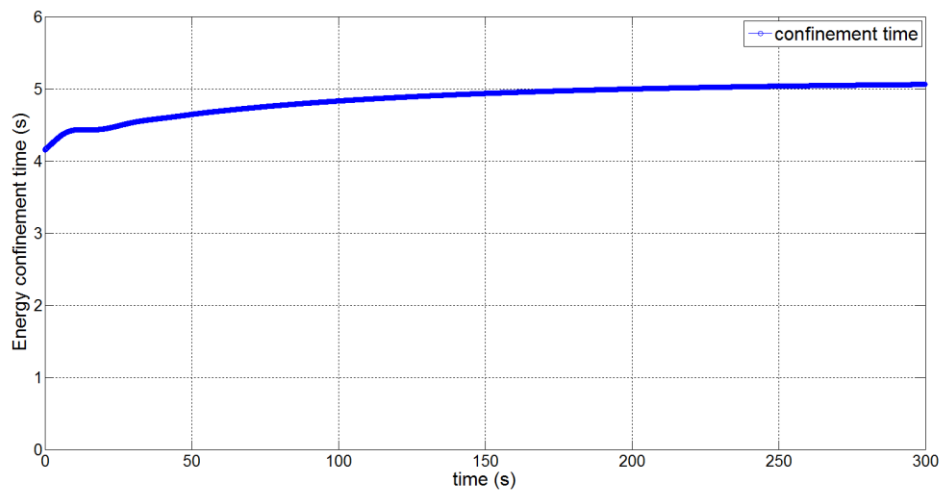


Figure 204: HCPB DEMO1 Tungsten permanent entrance x4 Confinement time graphic.

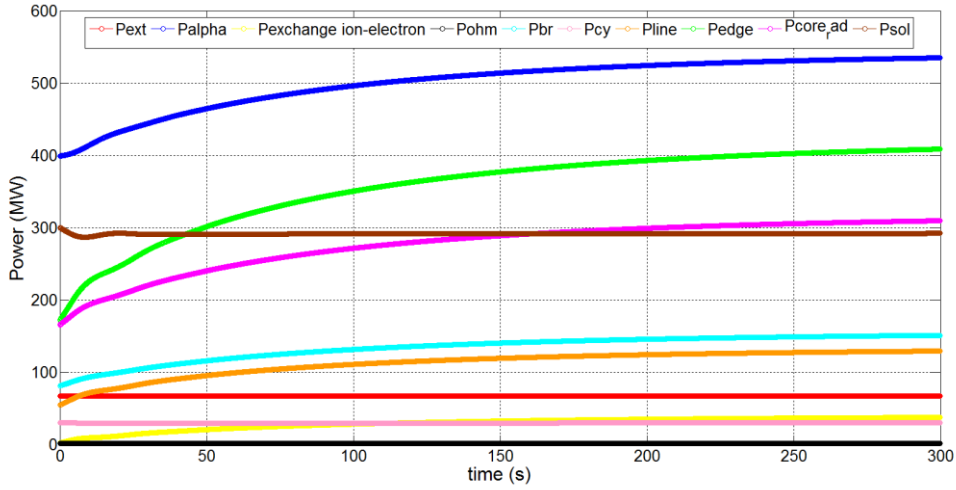


Figure 205: HCPB DEMO1 Tungsten permanent entrance x4 Powers graphic.

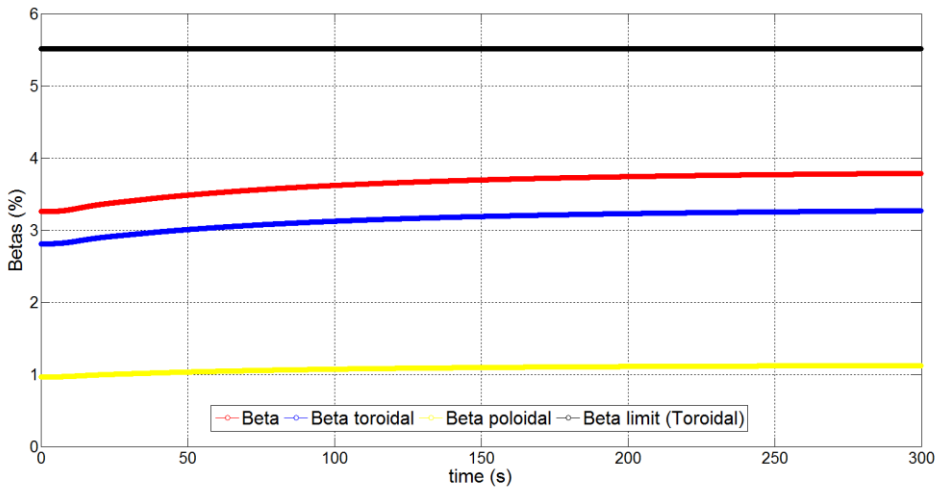


Figure 206: HCPB DEMO1 Tungsten permanent entrance x4 Betas graphic.

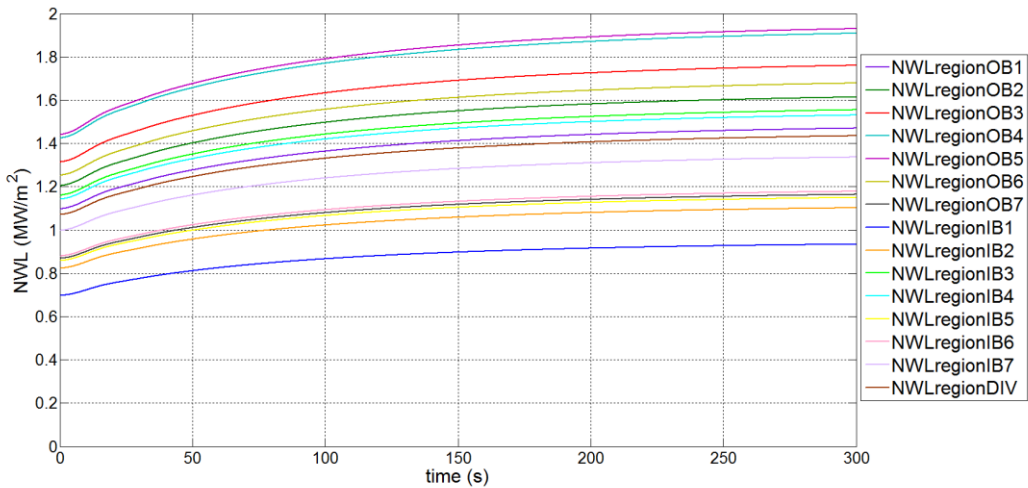


Figure 207: HCPB DEMO1 Tungsten permanent entrance x4 NWL graphic.

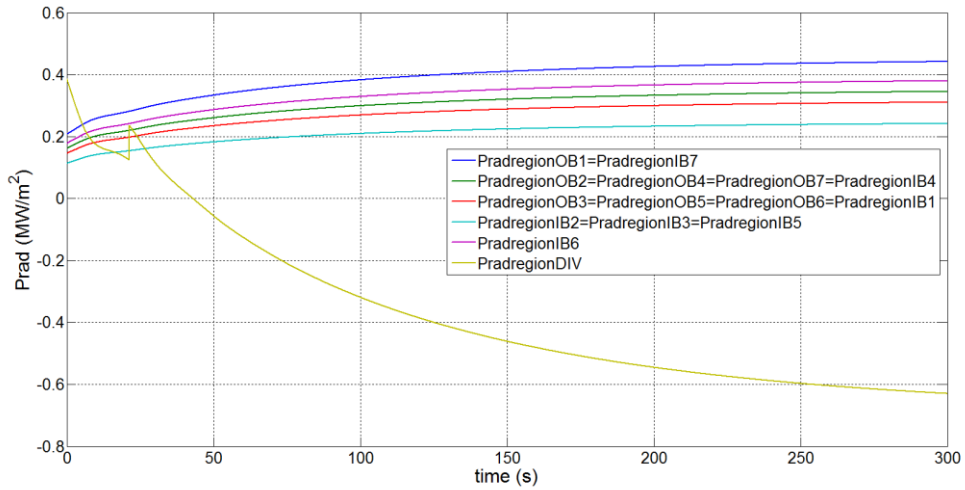


Figure 208: HCPB DEMO1 Tungsten permanent entrance x4  $P_{rad}$  graphic.

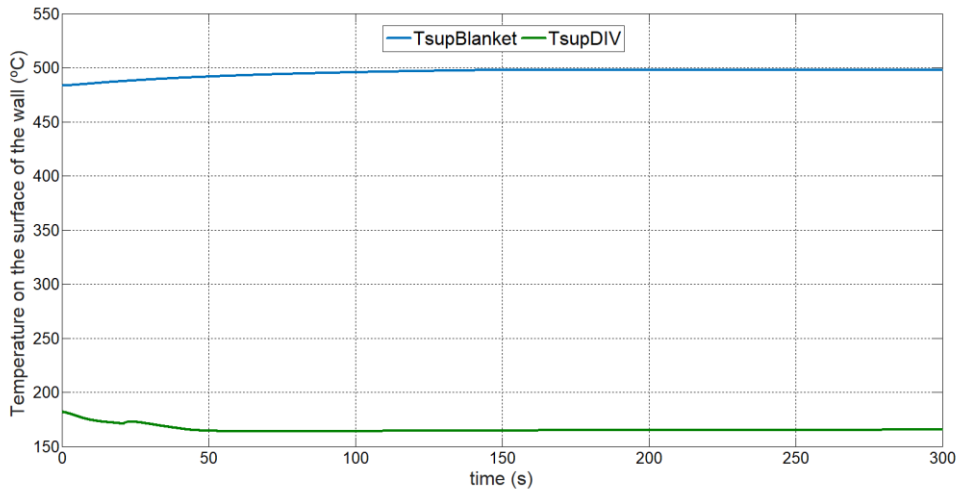


Figure 209: HCPB DEMO1 Tungsten permanent entrance x4 Temperature on the surface of the blanket and divertor wall graphic.

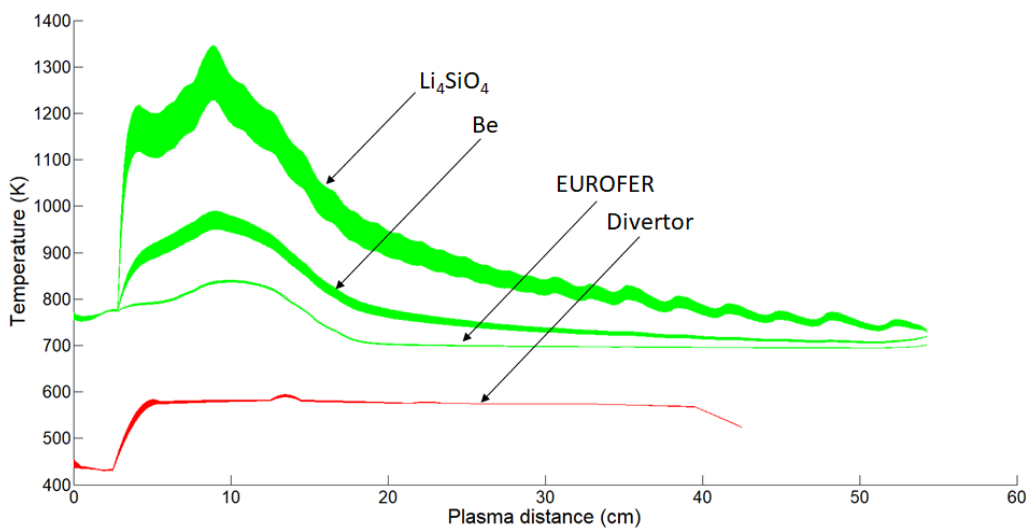


Figure 210: HCPB DEMO1 Tungsten permanent entrance x4 evolution of the BB and divertor temperature graphic.

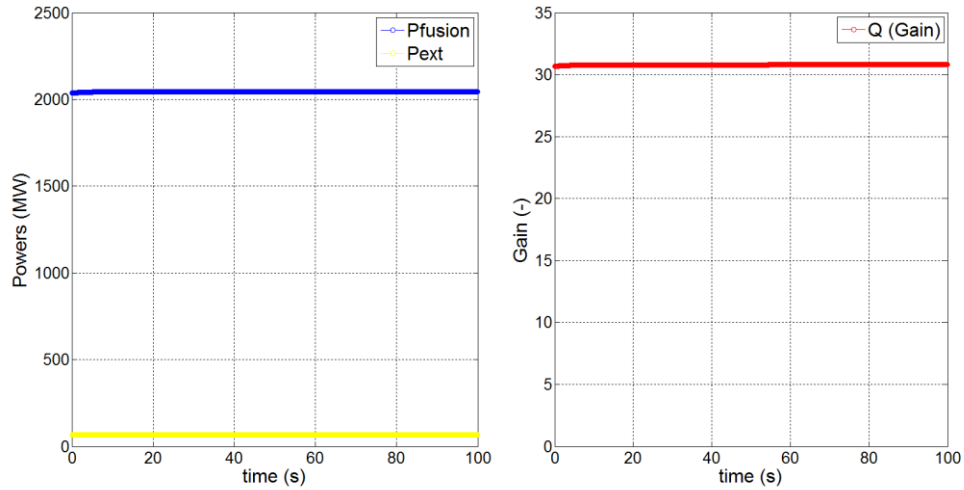


Figure 211: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2)  $P_{fus}$  and gain graphic.

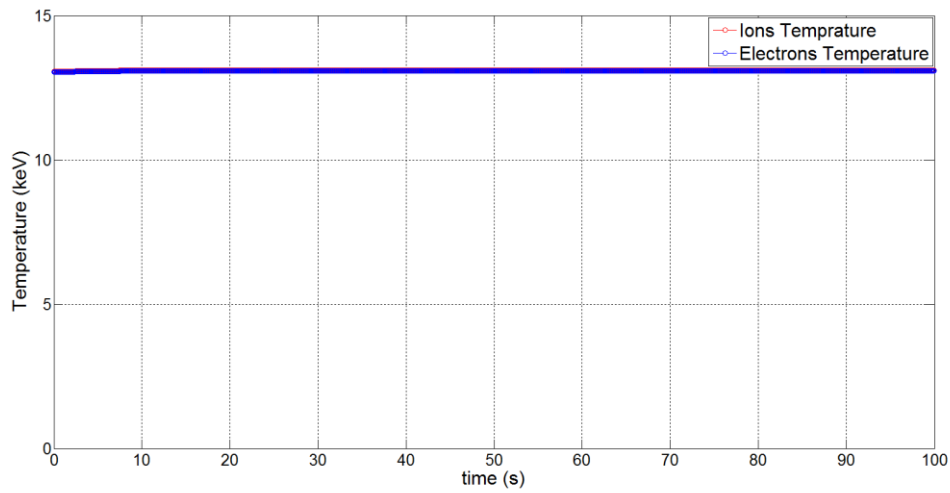


Figure 212: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2) Temperatures graphic.

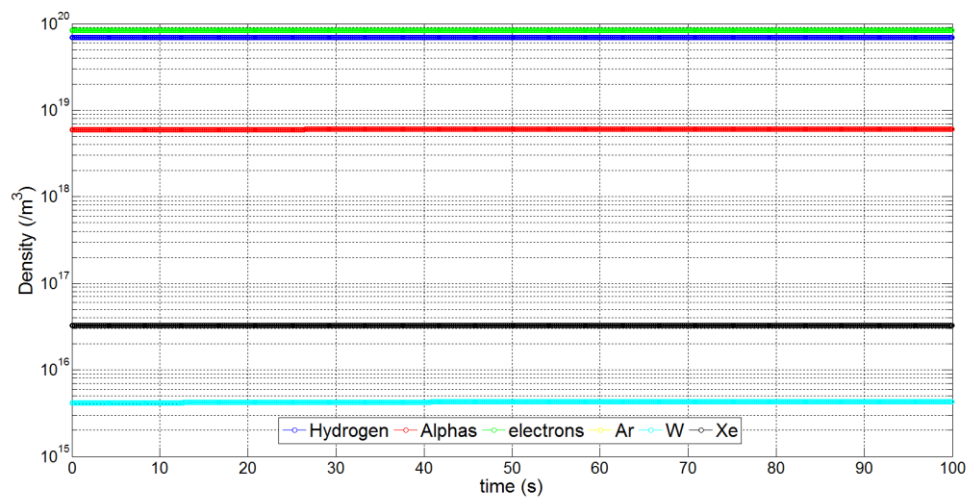


Figure 213: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2) Densities graphic.



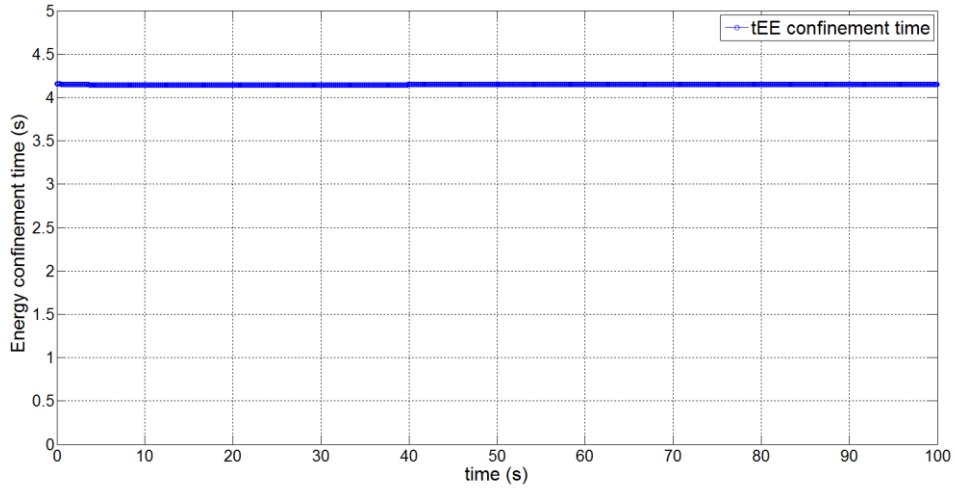


Figure 214: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2) Confinement time graphic.

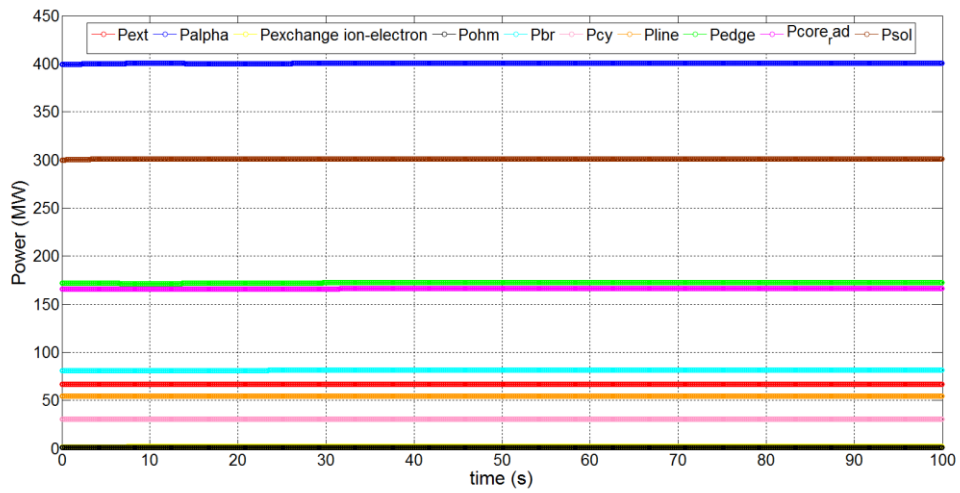


Figure 215: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2) Powers graphic.

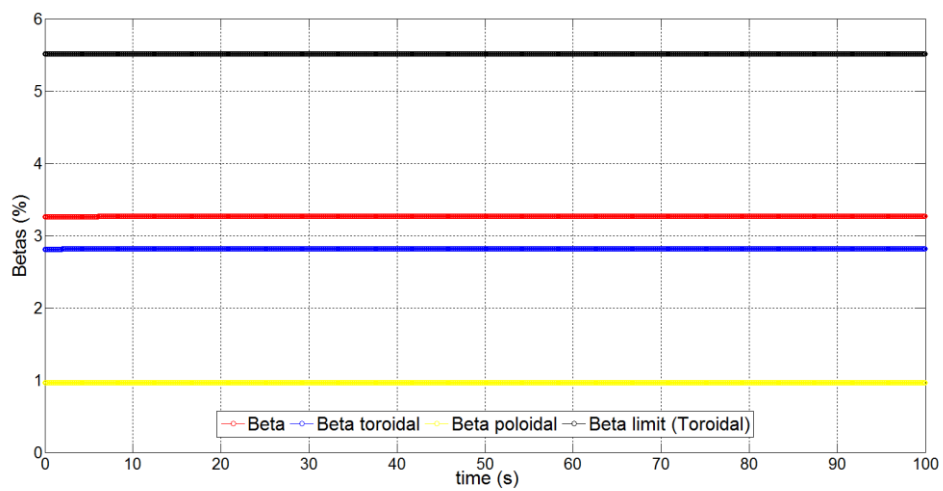


Figure 216: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2) Betas graphic.

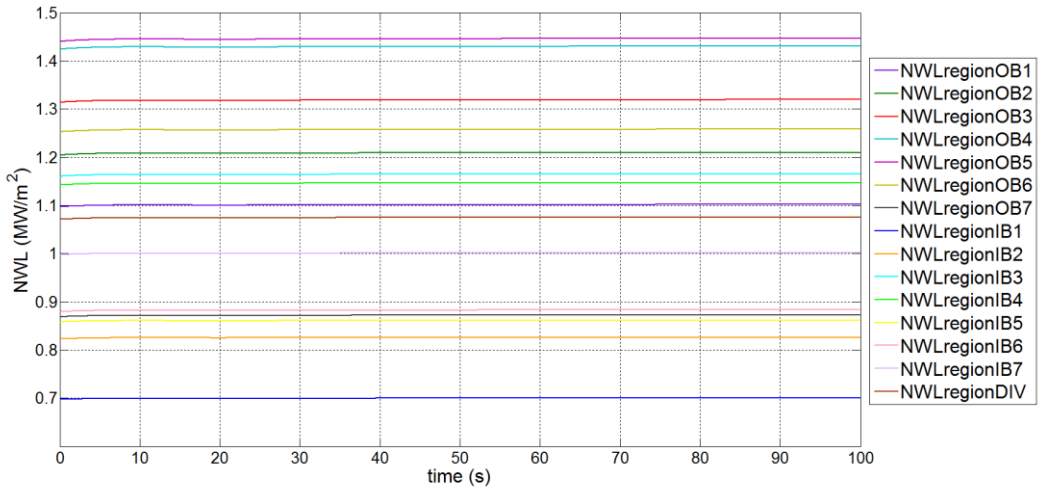


Figure 217: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2) NWL graphic.

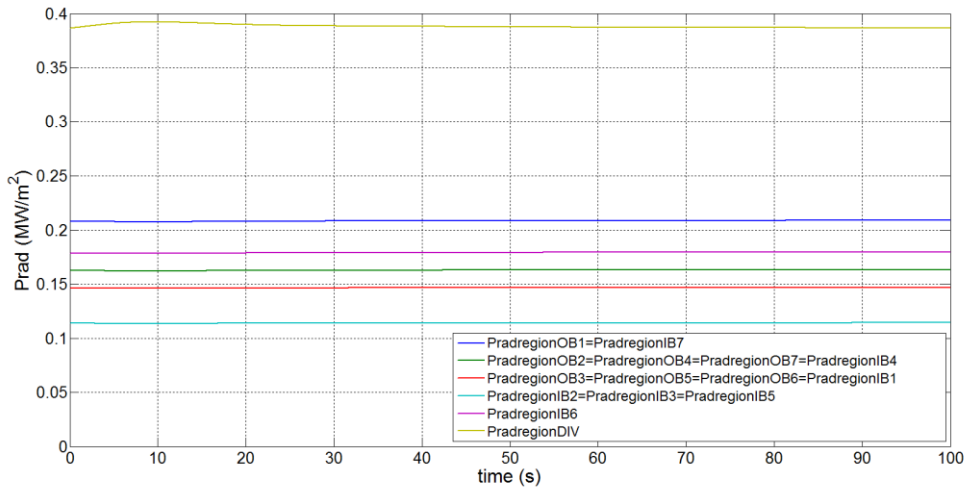


Figure 218: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2)  $P_{rad}$  graphic.

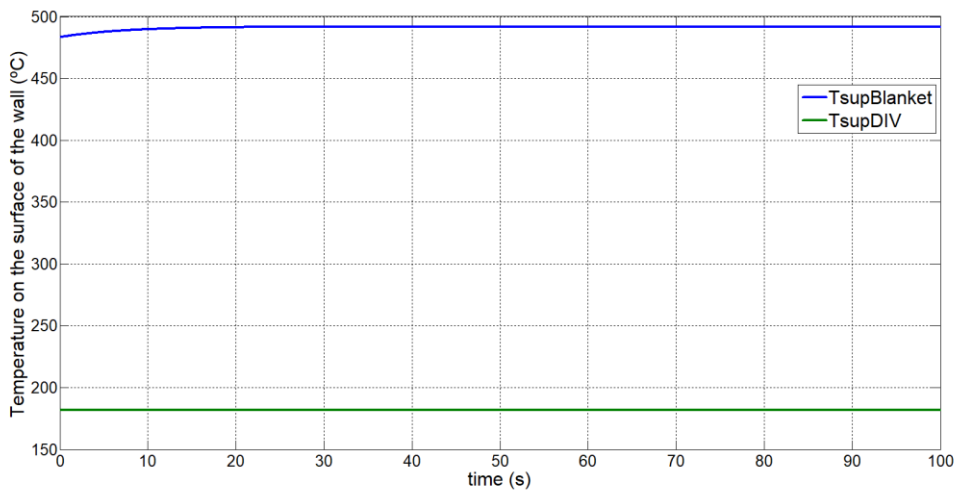


Figure 219: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2) Temperature on the surface of the blanket and divertor wall graphic.

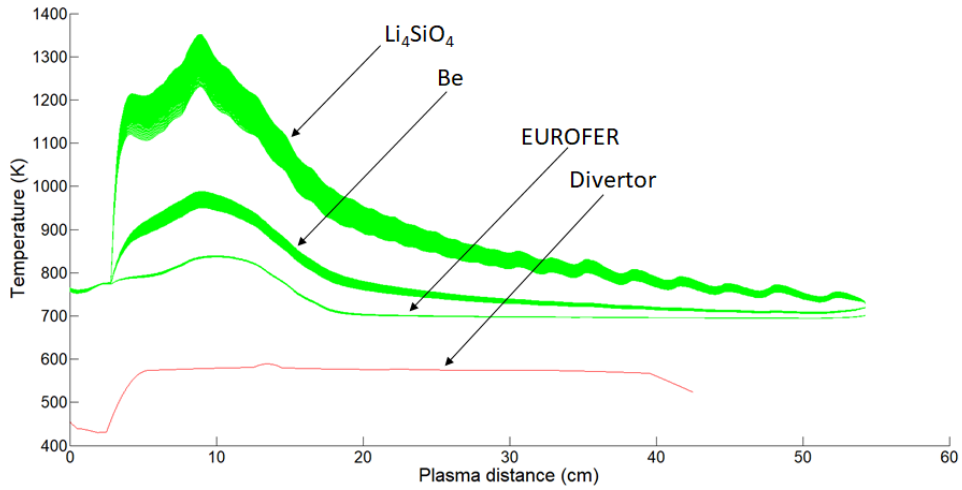


Figure 220: HCPB DEMO1 BB LOCA 30% in all the cooling loops (FW, loop No.1 and loop No.2) evolution of the BB and divertor temperature graphic.

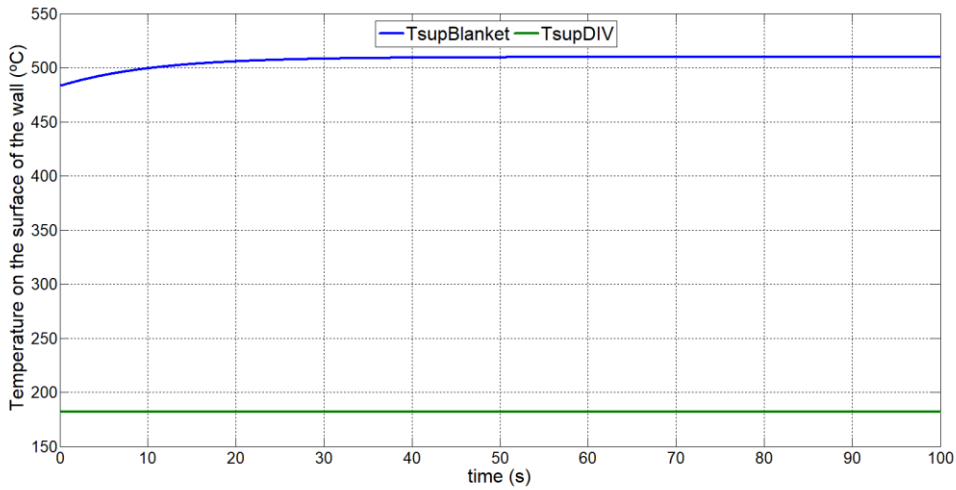


Figure 221: HCPB DEMO1 BB LOCA 60% in all the cooling loops (FW, loop No.1 and loop No.2) Temperature on the surface of the blanket and divertor wall graphic.

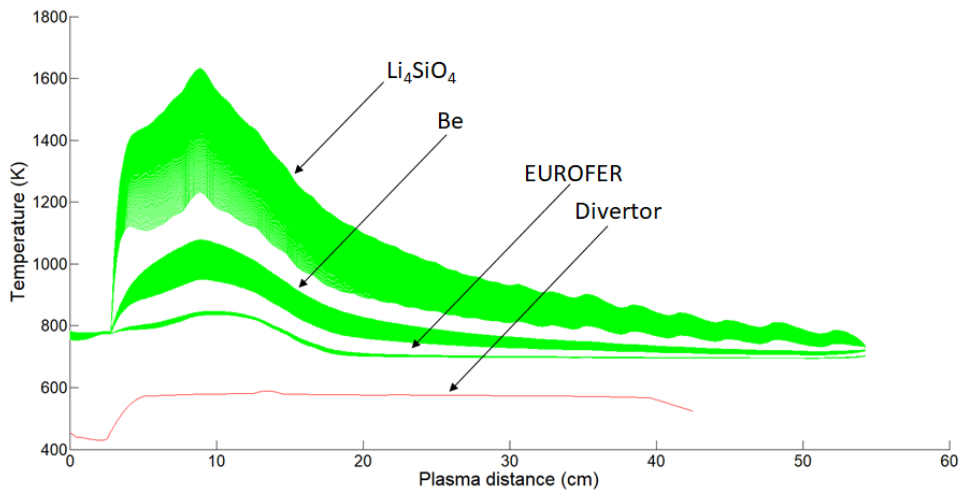


Figure 222: HCPB DEMO1 BB LOCA 60% in all the cooling loops (FW, loop No.1 and loop No.2) evolution of the BB and divertor temperature graphic.

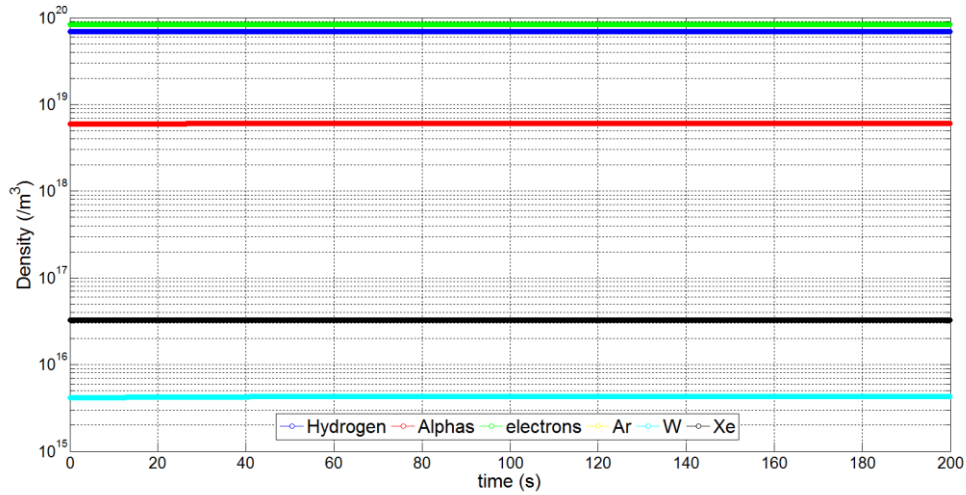


Figure 223: HCPB DEMO1 BB LOCA 90% in all the cooling loops (FW, loop No.1 and loop No.2) Densities graphic.

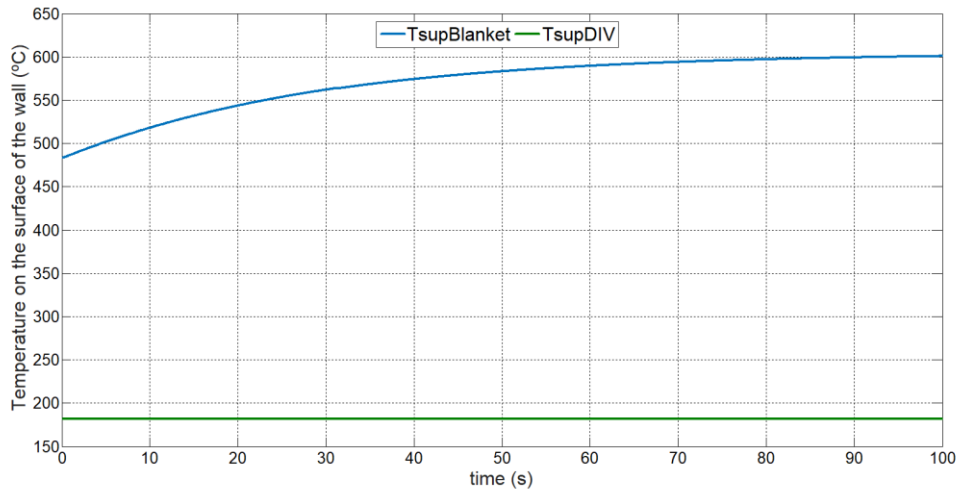


Figure 224: HCPB DEMO1 BB LOCA 90% in all the cooling loops (FW, loop No.1 and loop No.2) Temperature on the surface of the blanket and divertor wall graphic.

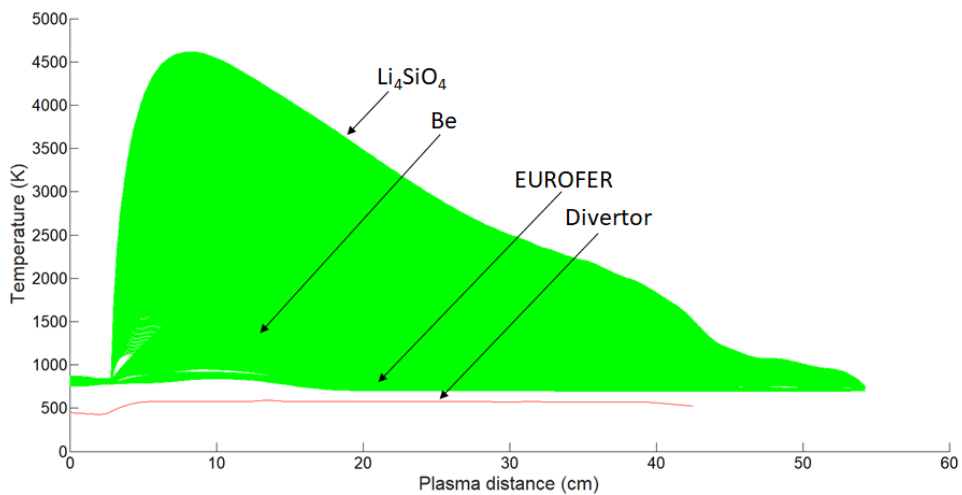


Figure 225: HCPB DEMO1 BB LOCA 90% in all the cooling loops (FW, loop No.1 and loop No.2) evolution of the BB and divertor temperature graphic.

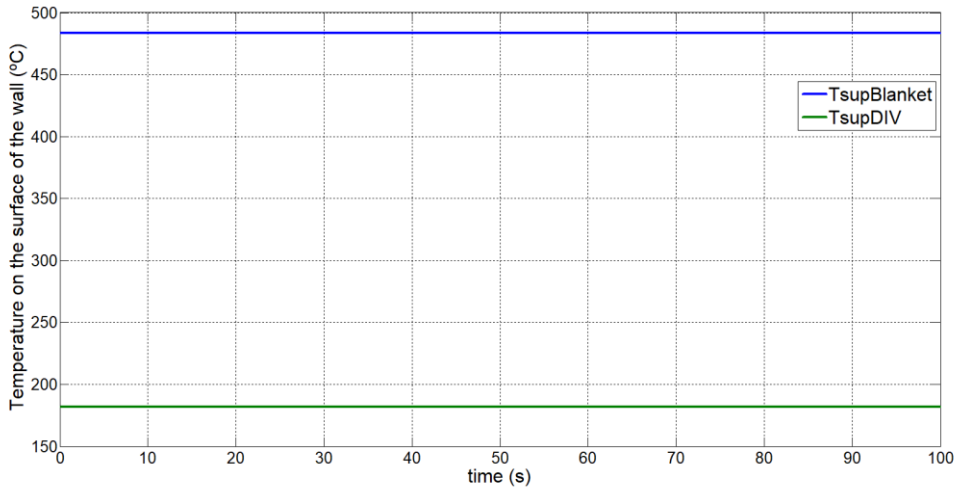


Figure 226: HCPB DEMO1 BB LOCA 90% in the loop No.1 and loop No.2 cooling loops Temperature on the surface of the blanket and divertor wall graphic.

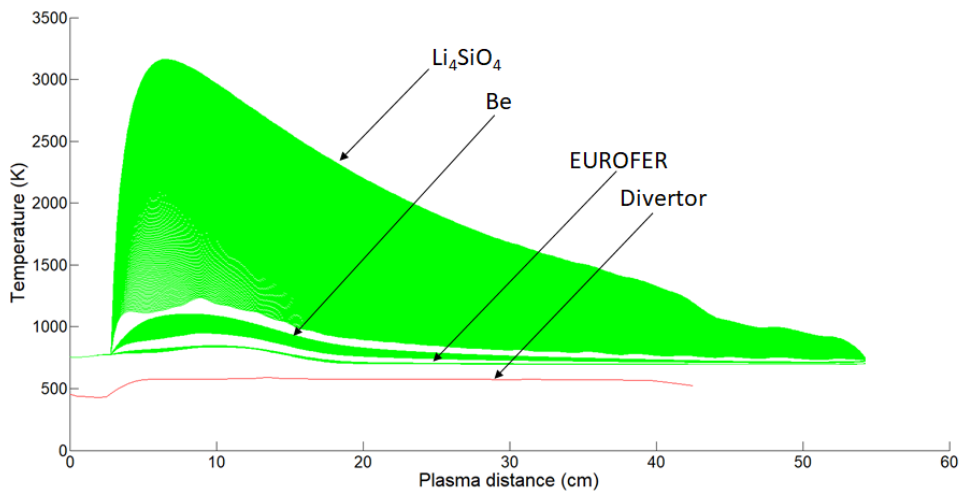


Figure 227: HCPB DEMO1 BB LOCA 90% in the loop No.1 and loop No.2 cooling loops evolution of the BB and divertor temperature graphic.

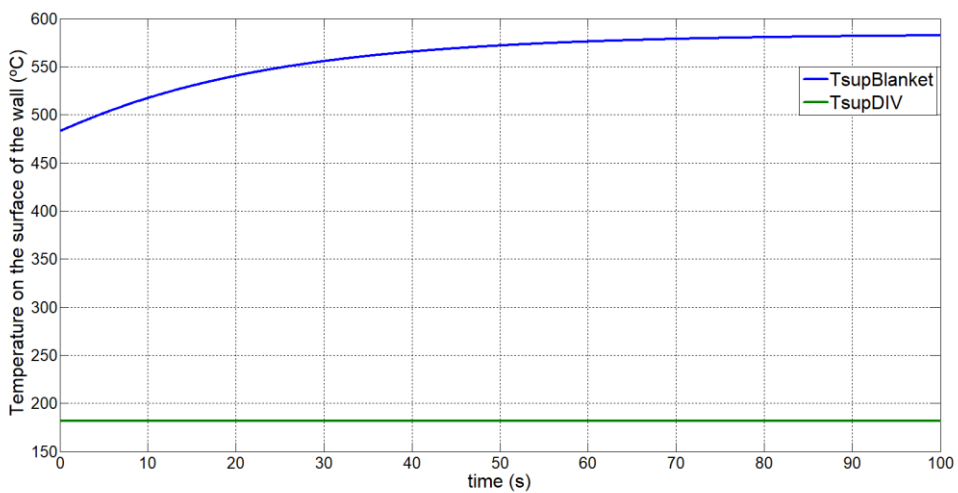


Figure 228: HCPB DEMO1 BB LOCA 90% in the FW cooling loop Temperature on the surface of the blanket and divertor wall graphic.

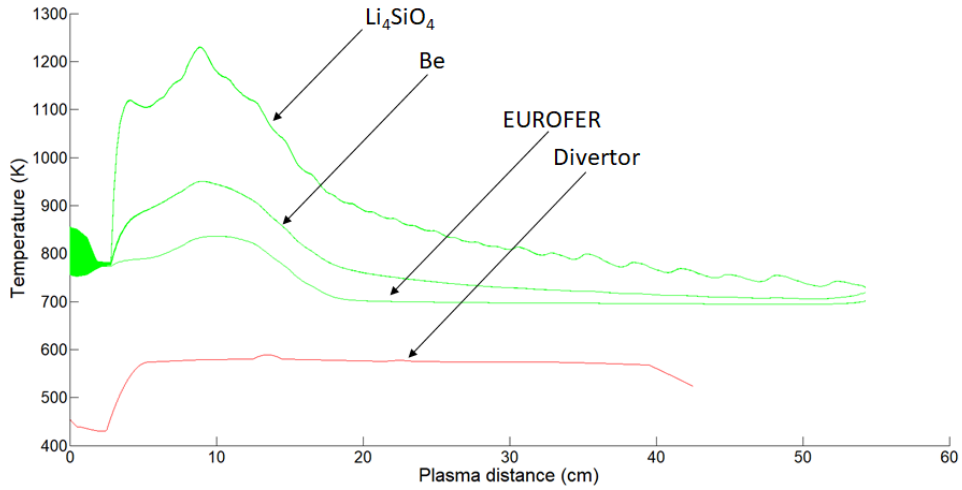


Figure 229: HCPB DEMO1 BB LOCA 90% in the FW cooling loop evolution of the BB and divertor temperature graphic.

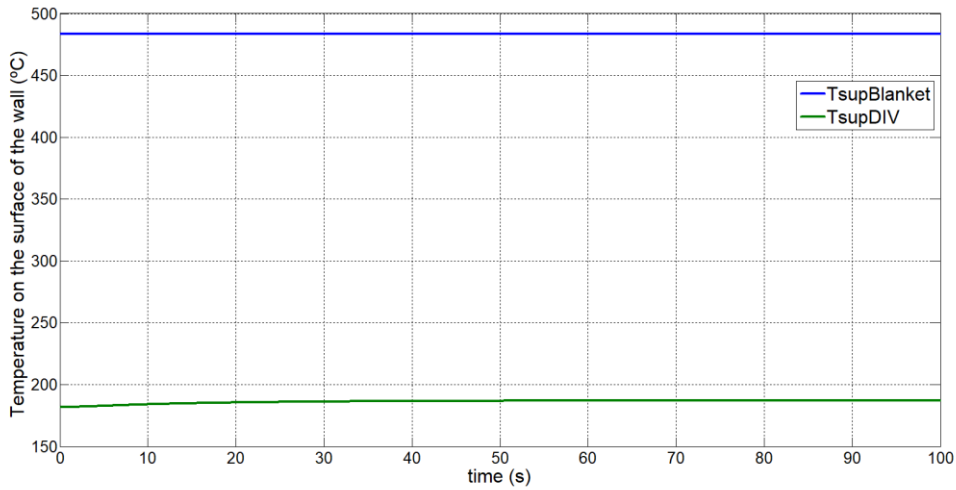


Figure 230: HCPB DEMO1 Divertor LOCA 30% in all the cooling loops (PFC and CB) Temperature on the surface of the blanket and divertor wall graphic.

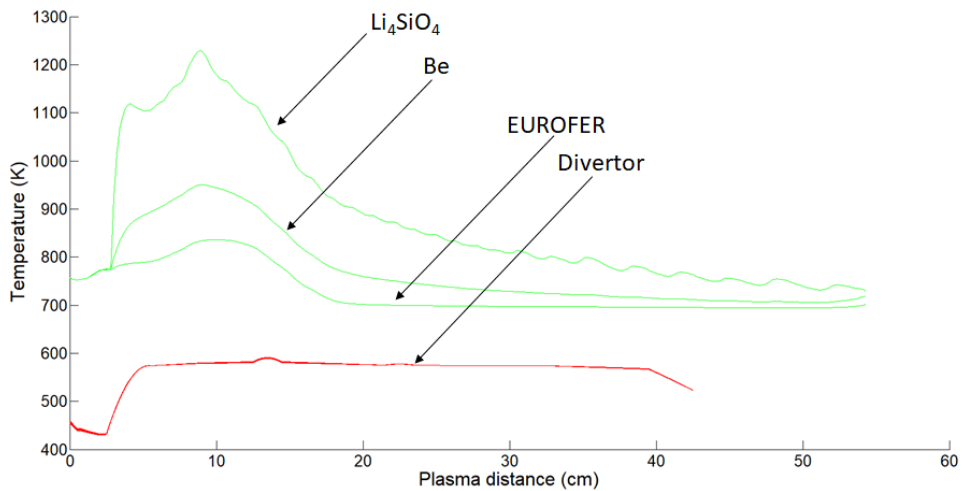


Figure 231: HCPB DEMO1 Divertor LOCA 30% in all the cooling loops (PFC and CB) evolution of the BB and divertor temperature graphic.

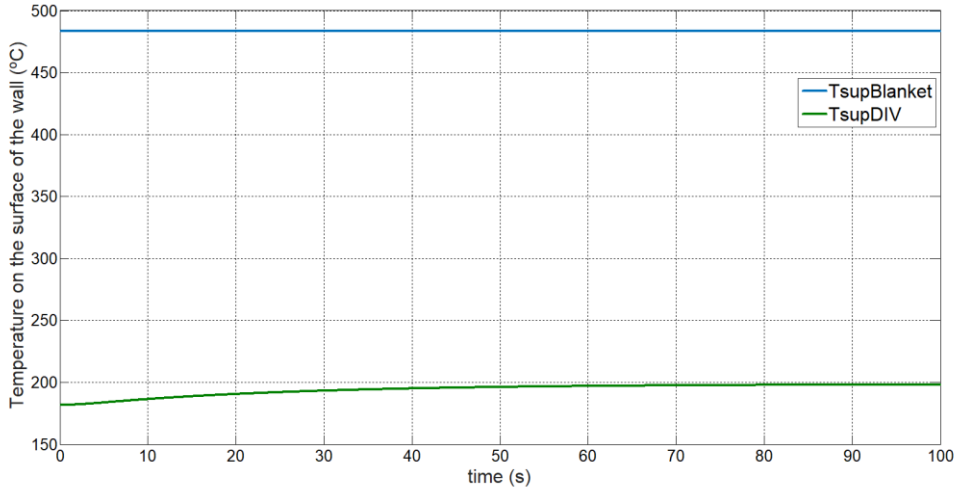


Figure 232: HCPB DEMO1 Divertor LOCA 60% in all the cooling loops (PFC and CB) Temperature on the surface of the blanket and divertor wall graphic.

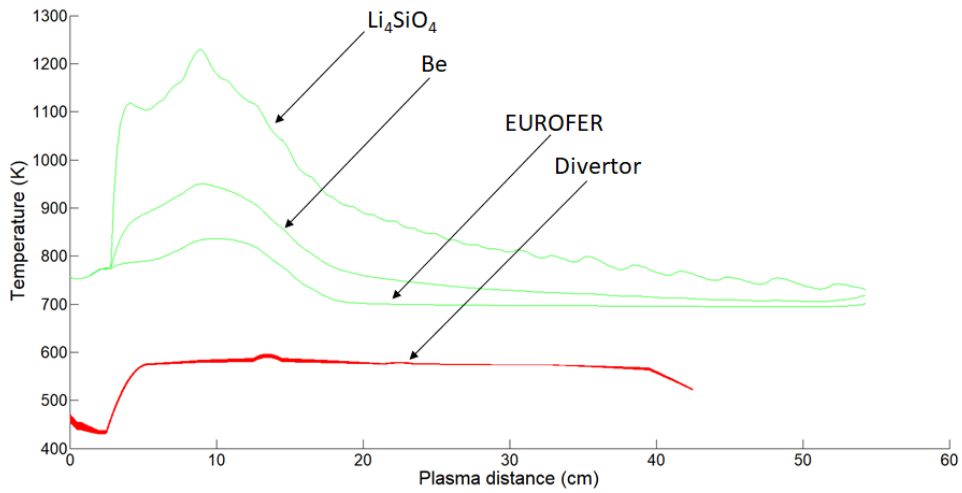


Figure 233: HCPB DEMO1 Divertor LOCA 60% in all the cooling loops (PFC and CB) evolution of the BB and divertor temperature graphic.

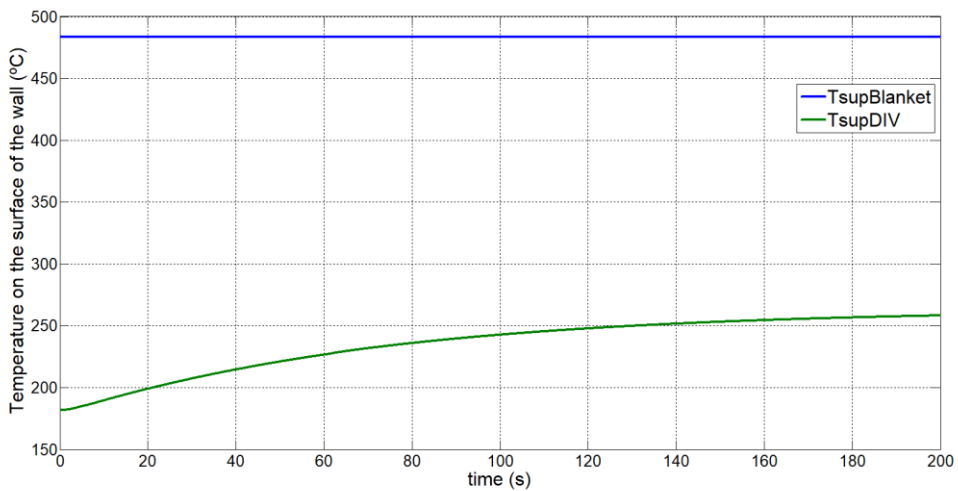


Figure 234: HCPB DEMO1 Divertor LOCA 90% in all the cooling loops (PFC and CB) Temperature on the surface of the blanket and divertor wall graphic.

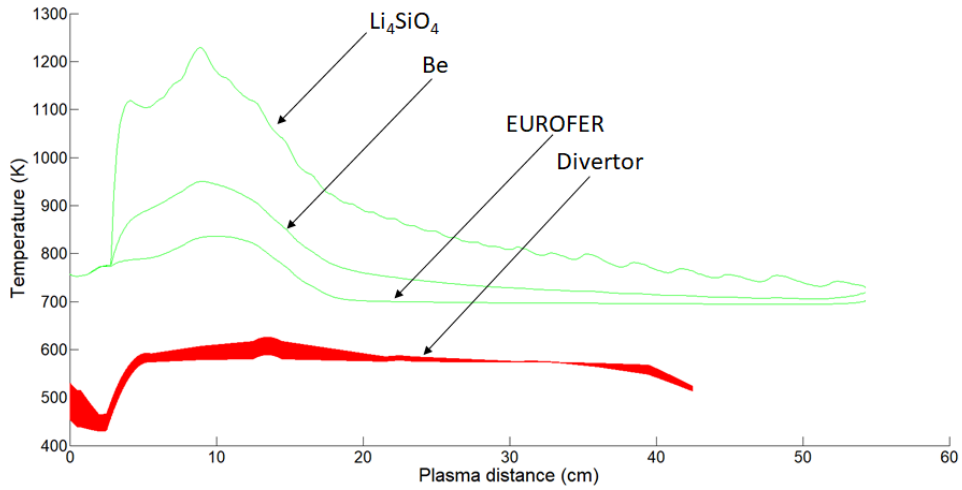


Figure 235: HCPB DEMO1 Divertor LOCA 90% in all the cooling loops (PFC and CB) evolution of the BB and divertor temperature graphic.

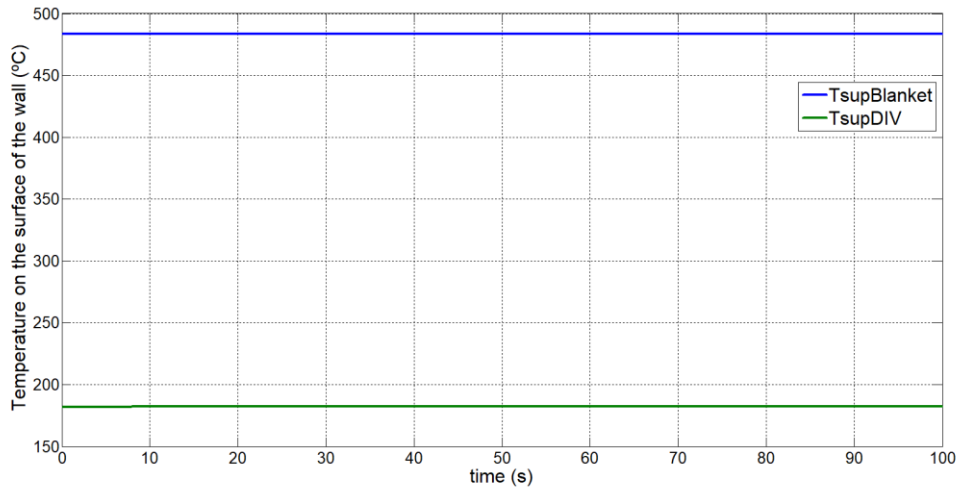


Figure 236: HCPB DEMO1 Divertor LOCA 90% in all the CB cooling loop Temperature on the surface of the blanket and divertor wall graphic.

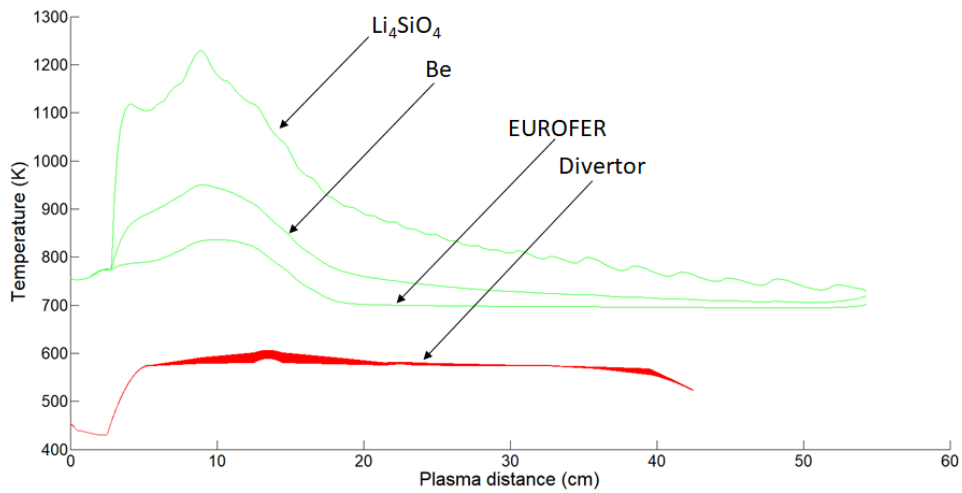


Figure 237: HCPB DEMO1 Divertor LOCA 90% in all the CB cooling loop evolution of the BB and divertor temperature graphic.



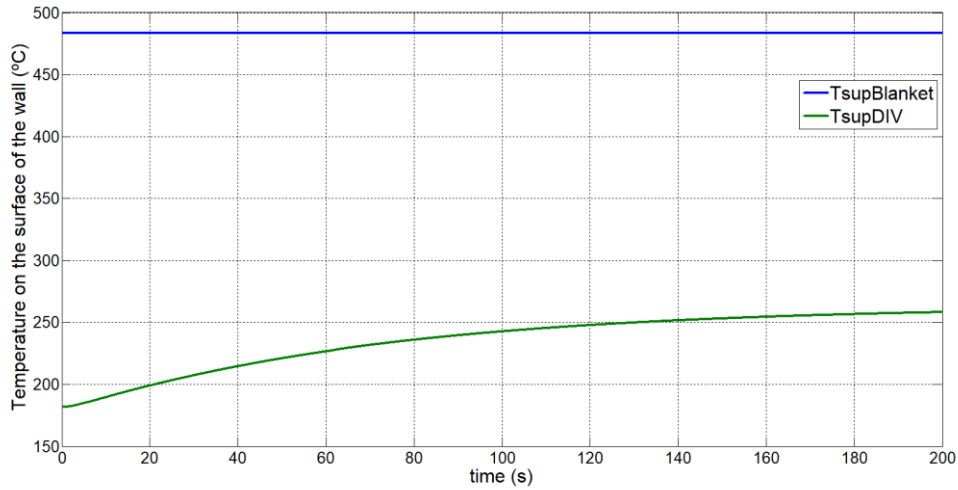


Figure 238: HCPB DEMO1 Divertor LOCA 90% in all the PFC cooling loop Temperature on the surface of the blanket and divertor wall graphic.

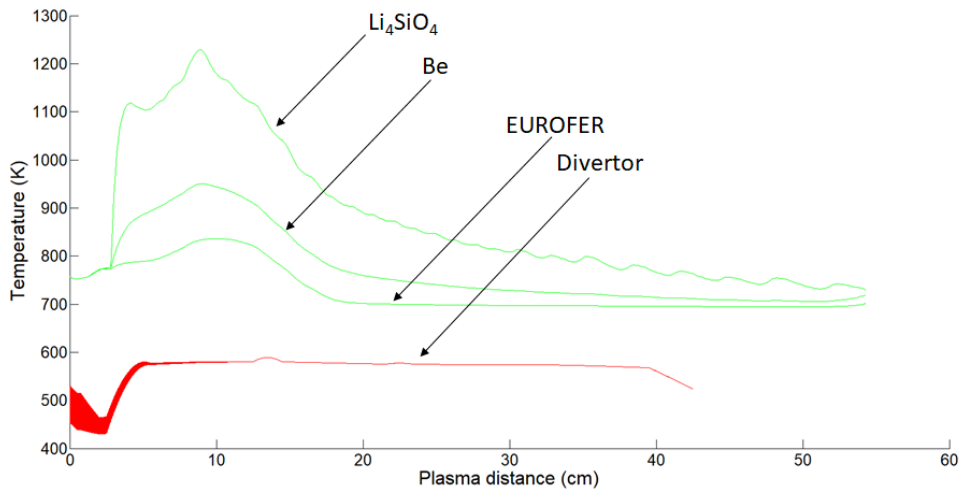


Figure 239: HCPB DEMO1 Divertor LOCA 90% in all the PFC cooling loop evolution of the BB and divertor temperature graphic.

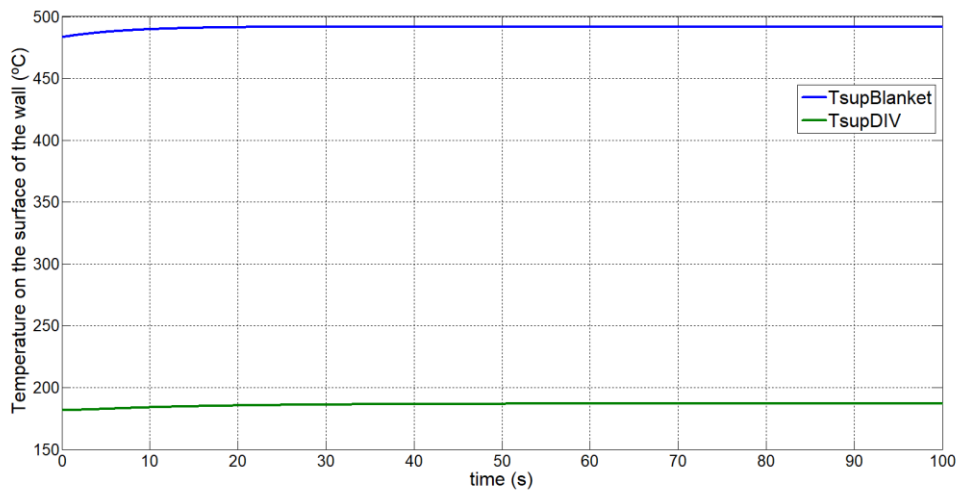


Figure 240: HCPB DEMO1 Divertor and BB LOCA 30% in all the cooling loops Temperature on the surface of the blanket and divertor wall graphic.

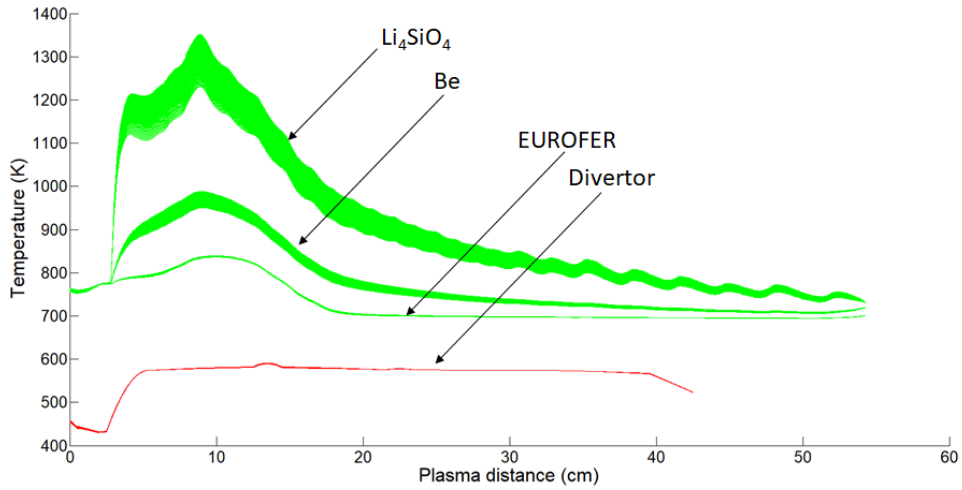


Figure 241: HCPB DEMO1 Divertor and BB LOCA 30% in all the cooling loops evolution of the BB and divertor temperature graphic.

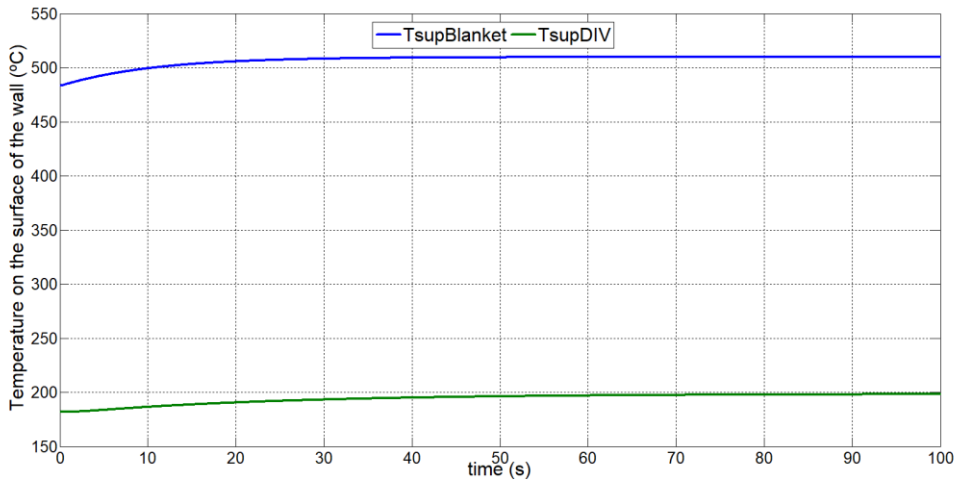


Figure 242: HCPB DEMO1 Divertor and BB LOCA 60% in all the cooling loops Temperature on the surface of the blanket and divertor wall graphic.

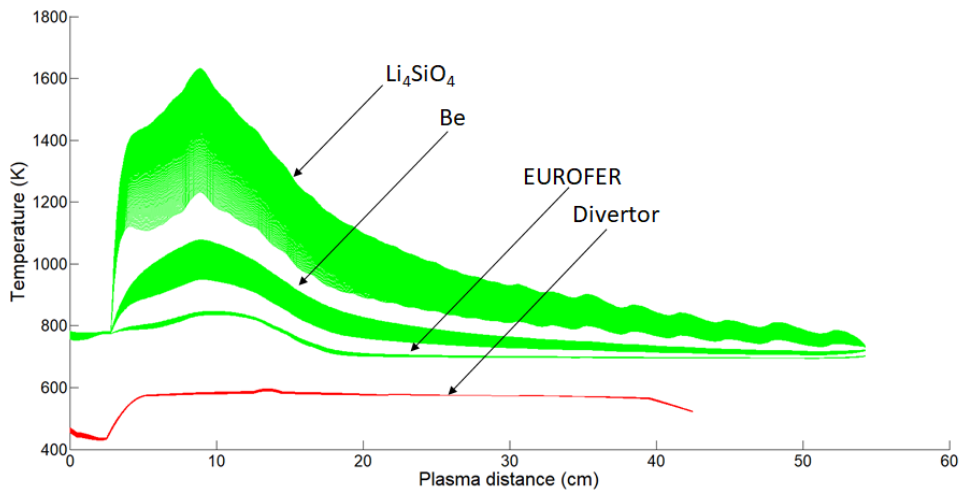


Figure 243: HCPB DEMO1 Divertor and BB LOCA 60% in all the cooling loops evolution of the BB and divertor temperature graphic.

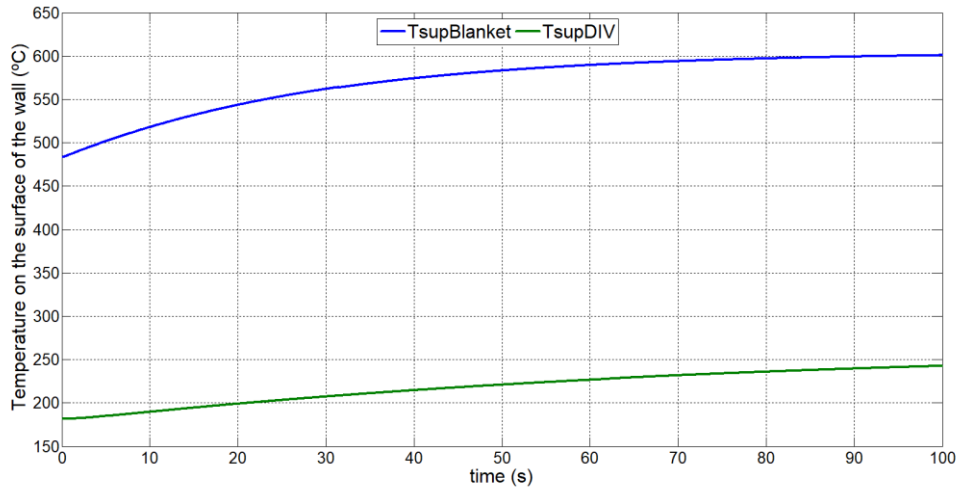


Figure 244: HCPB DEMO1 Divertor and BB LOCA 90% in all the cooling loops Temperature on the surface of the blanket and divertor wall graphic.

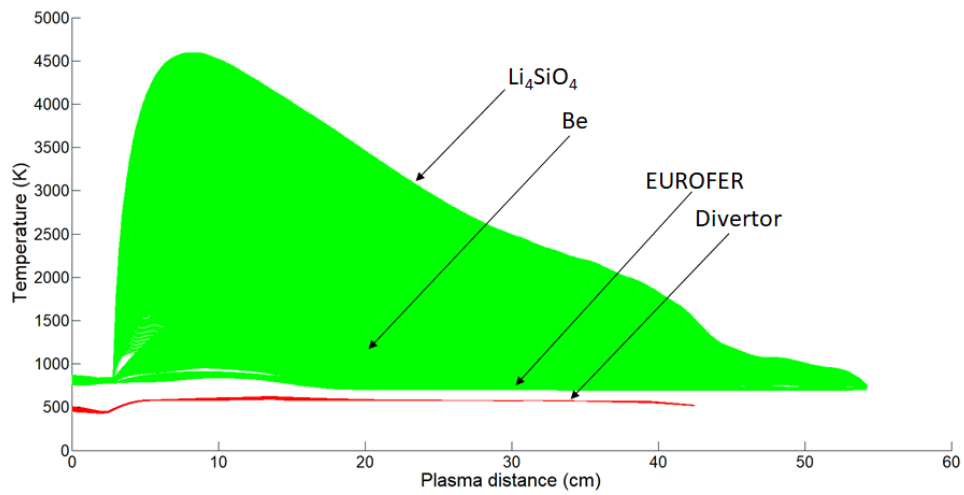


Figure 245: HCPB DEMO1 Divertor and BB LOCA 90% in all the cooling loops evolution of the BB and divertor temperature graphic.

## ANNEX B: DCLL graphics

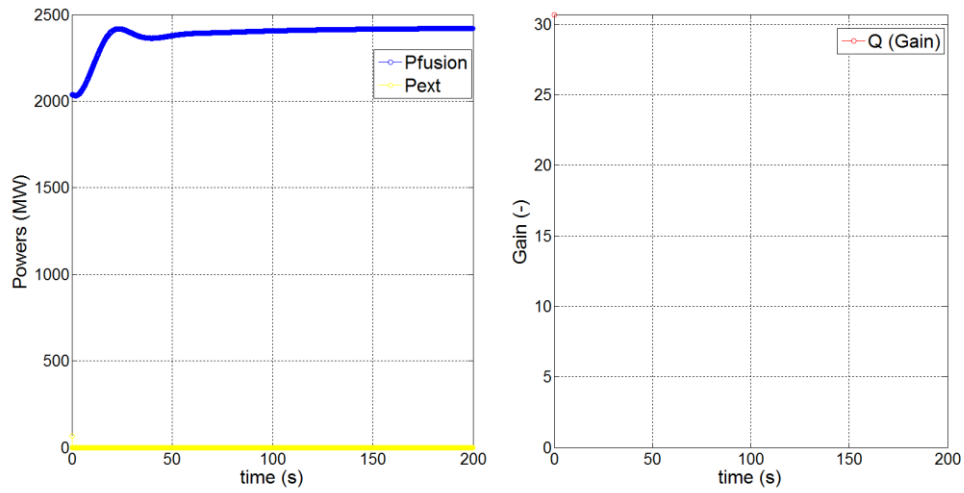


Figure 246: DCLL DEMO1 Auxiliary Heating Cut-off  $P_{\text{fus}}$  and gain graphic.

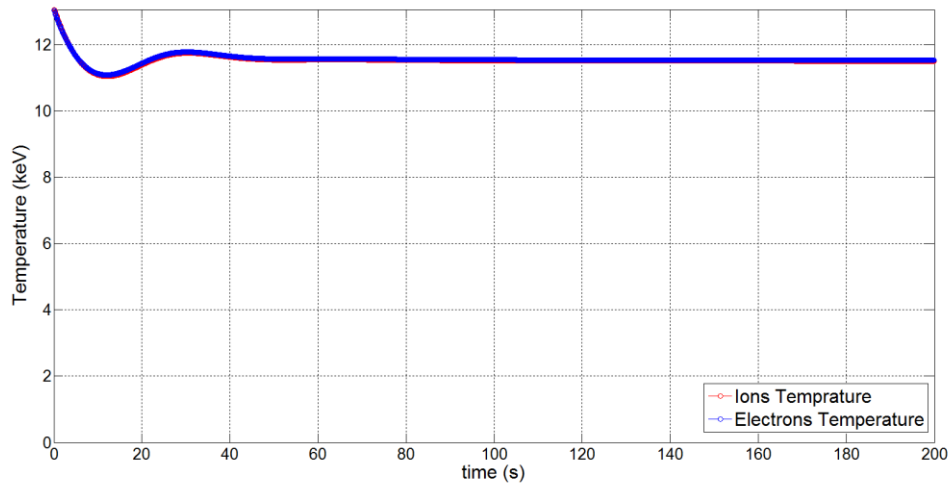


Figure 247: DCLL DEMO1 Auxiliary Heating Cut-off Temperatures graphic.

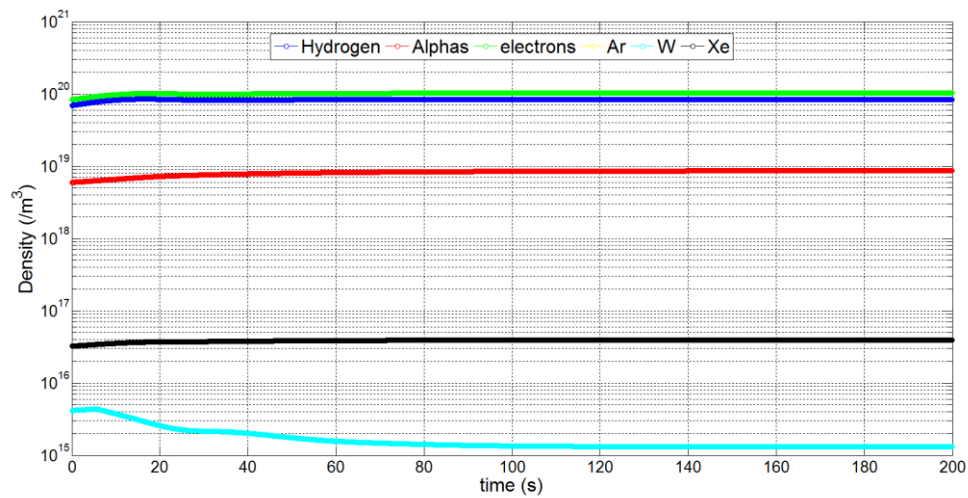


Figure 248: DCLL DEMO1 Auxiliary Heating Cut-off Densities graphic.

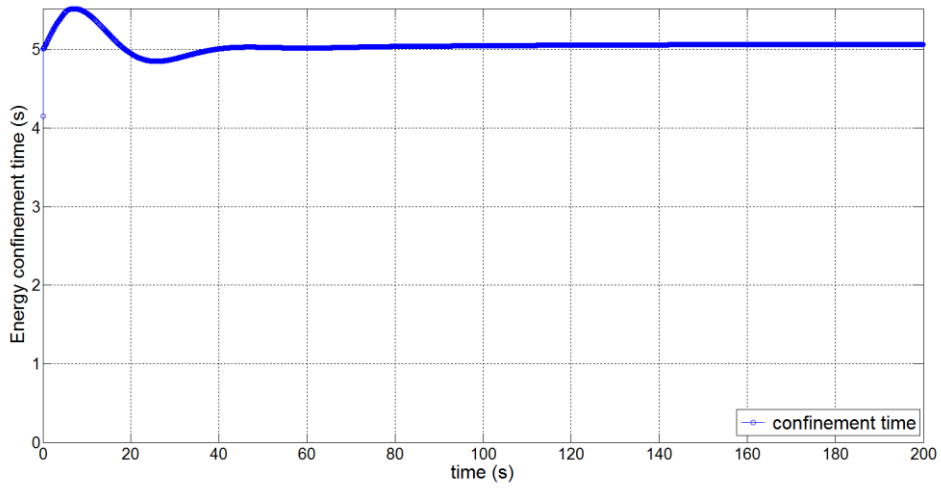


Figure 249: DCLL DEMO1 Auxiliary Heating Cut-off Confinement time graphic.

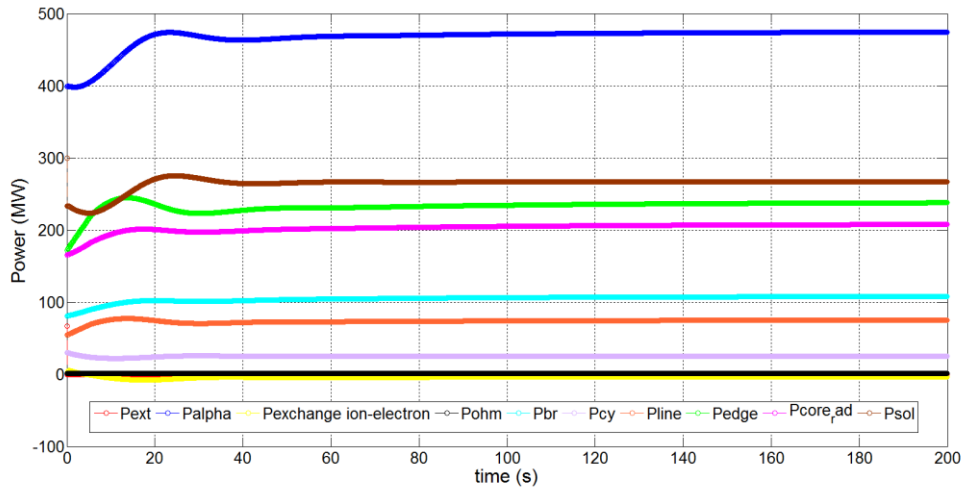


Figure 250: DCLL DEMO1 Auxiliary Heating Cut-off Powers graphic.

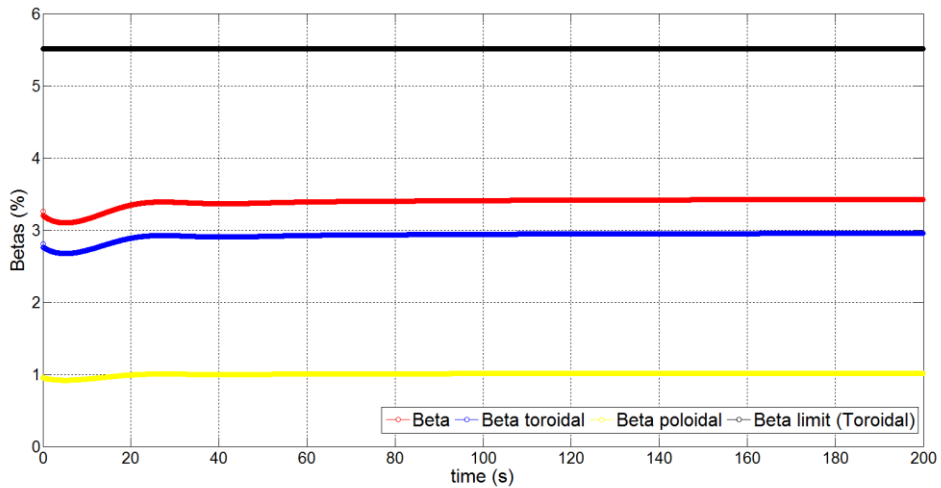


Figure 251: DCLL DEMO1 Auxiliary Heating Cut-off Betas graphic.

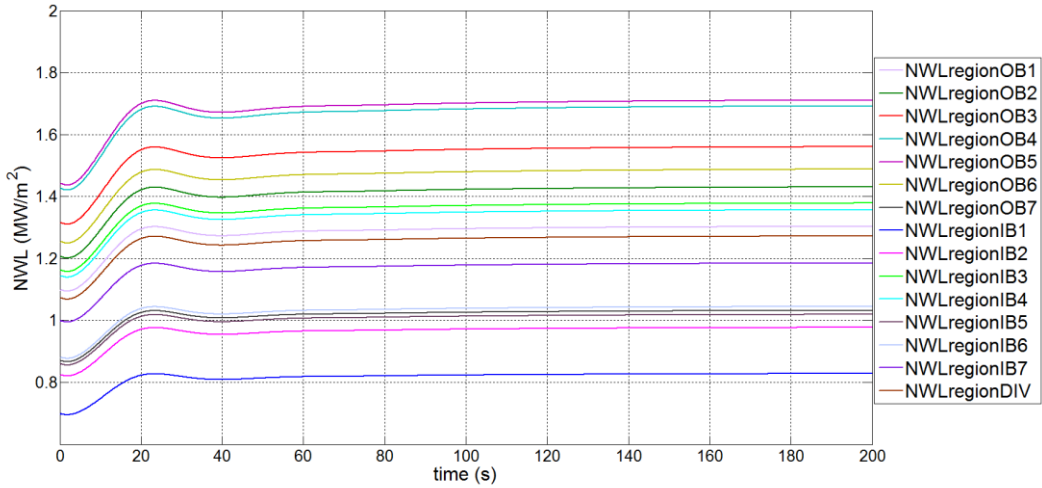


Figure 252: DCLL DEMO1 Auxiliary Heating Cut-off NWL graphic.

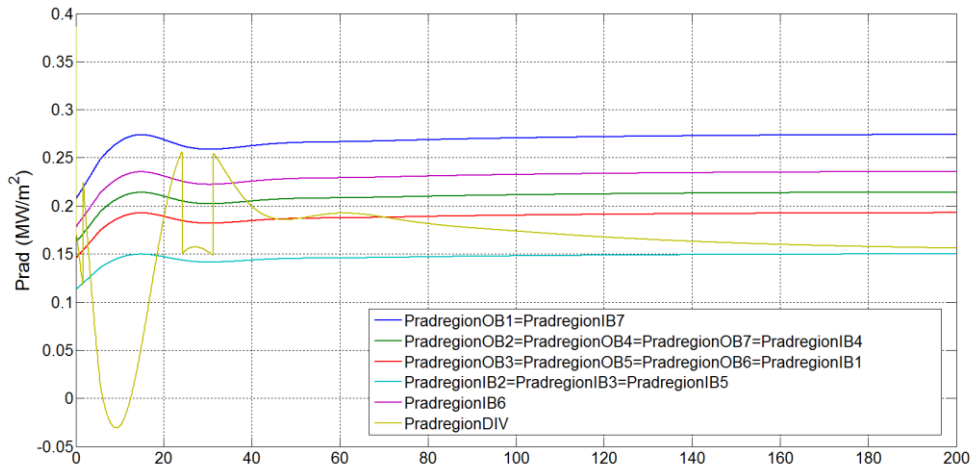


Figure 253: DCLL DEMO1 Auxiliary Heating Cut-off  $P_{rad}$  graphic.

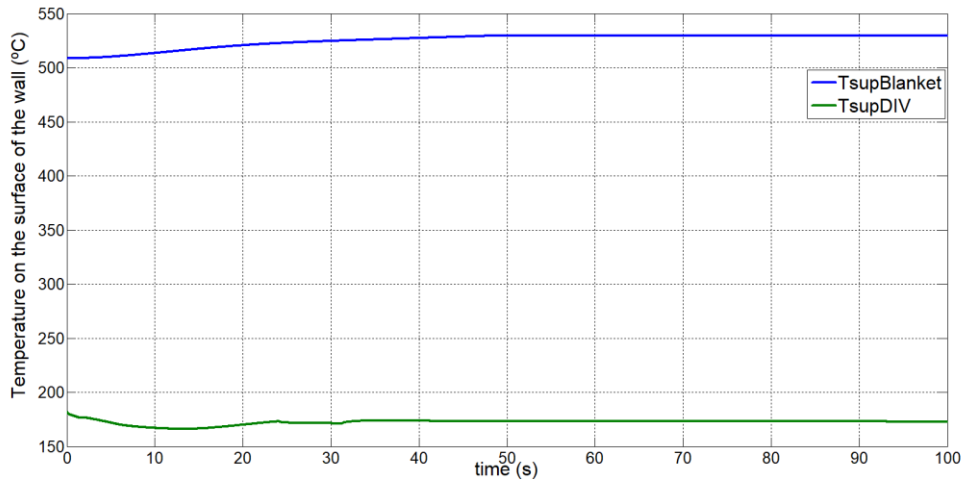


Figure 254: DCLL DEMO1 Auxiliary Heating Cut-off Temperature on the surface of the blanket and divertor wall graphic.

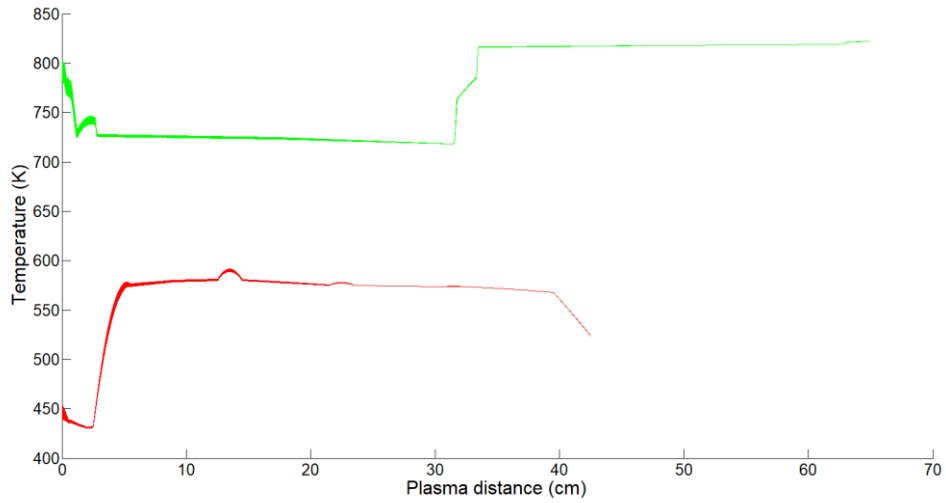


Figure 255: DCLL DEMO1 Auxiliary Heating Cut-off evolution of the BB and divertor temperature graphic.

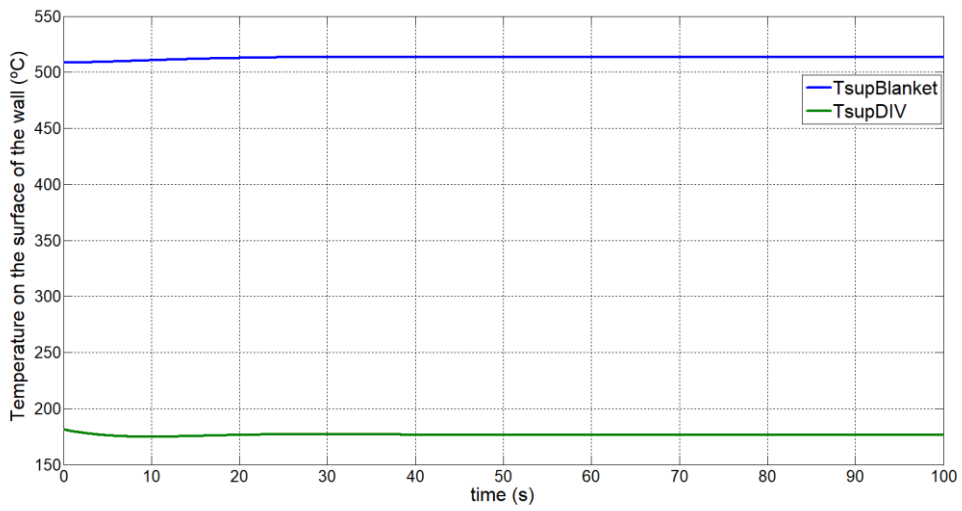


Figure 256: DCLL DEMO1 Auxiliary Heating sudden decrease x0.5 Temperature on the surface of the blanket and divertor wall graphic.

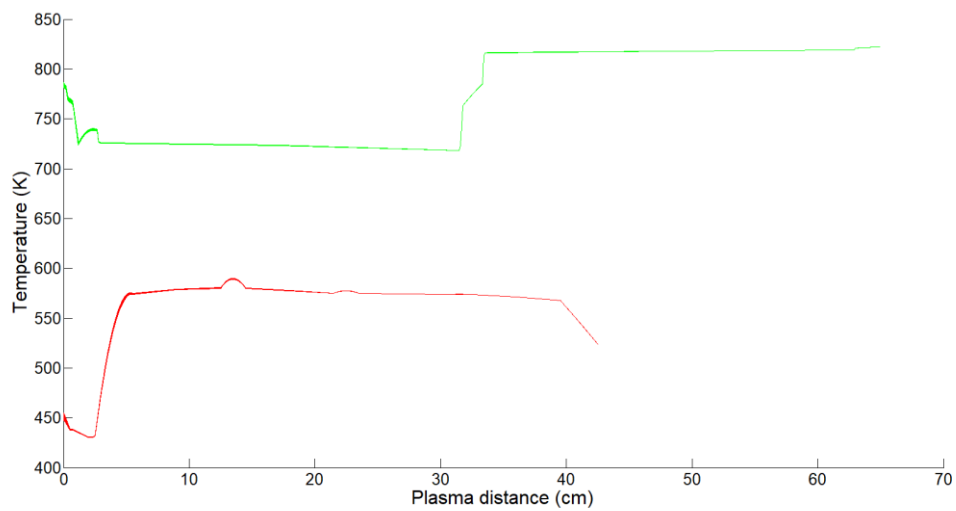


Figure 257: DCLL DEMO1 Auxiliary Heating sudden decrease x0.5 evolution of the BB and divertor temperature graphic.

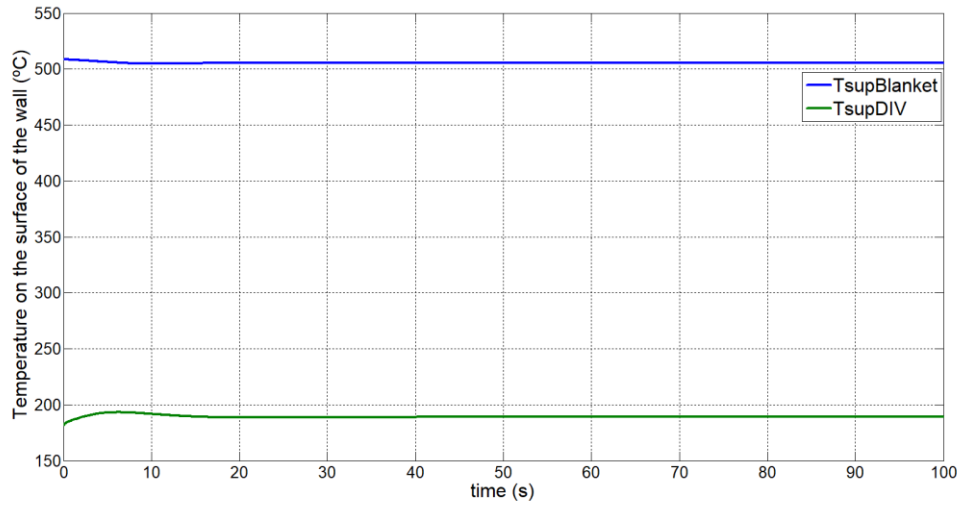


Figure 258: DCLL DEMO1 Auxiliary Heating sudden decrease x2 Temperature on the surface of the blanket and divertor wall graphic.

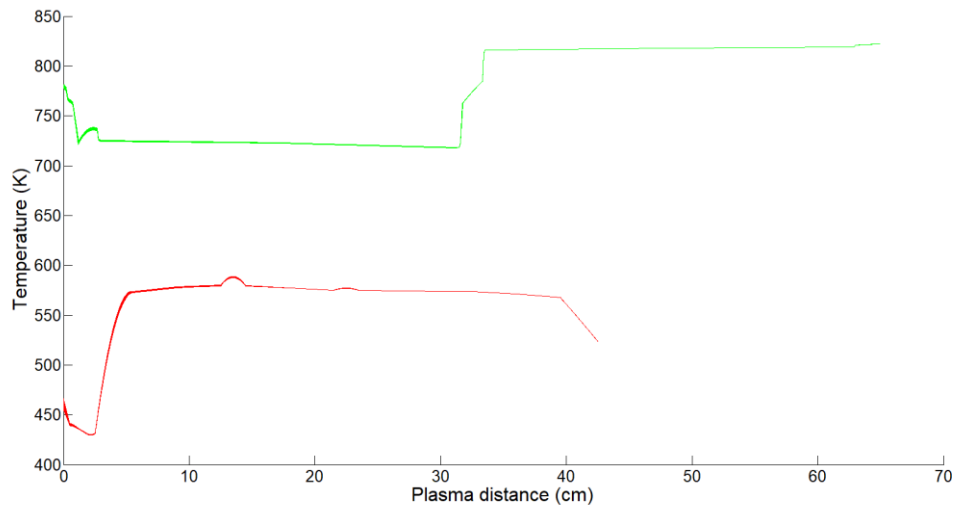


Figure 259: DCLL DEMO1 Auxiliary Heating sudden decrease x2 evolution of the BB and divertor temperature graphic.

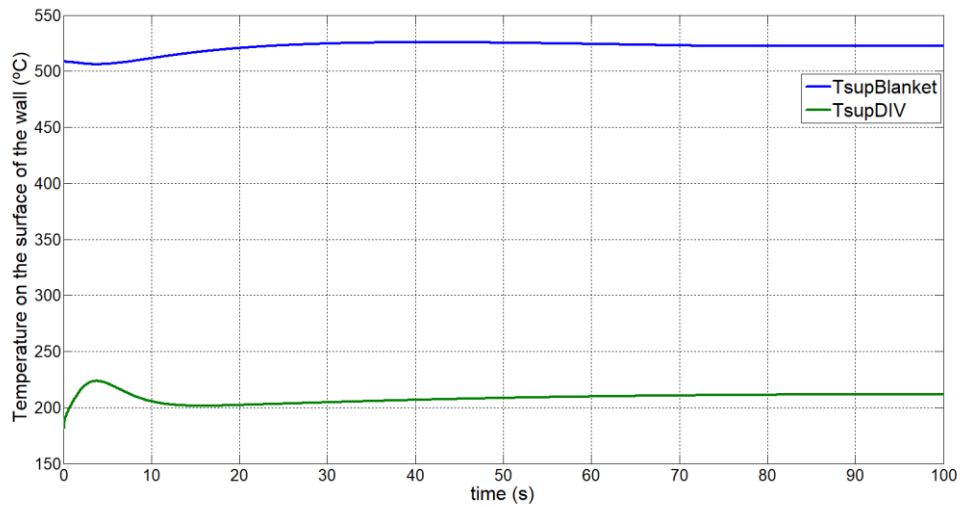


Figure 260: DCLL DEMO1 Auxiliary Heating sudden decrease x6 Temperature on the surface of the blanket and divertor wall graphic.



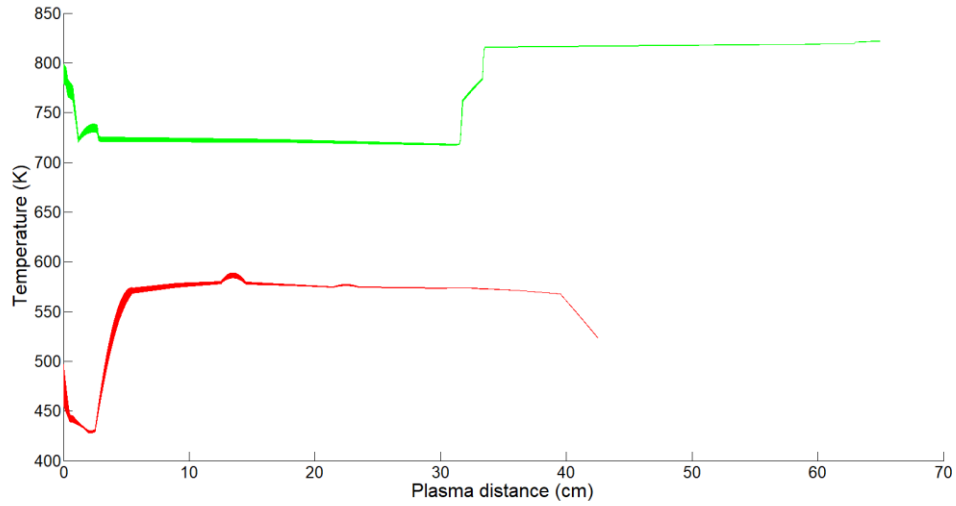


Figure 261: DCLL DEMO1 Auxiliary Heating sudden decrease x6 evolution of the BB and divertor temperature graphic.

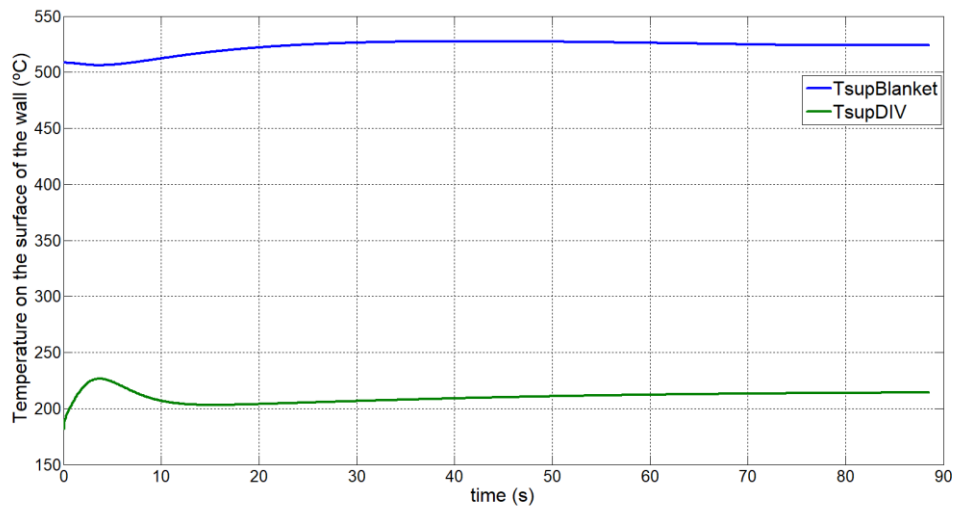


Figure 262: DCLL DEMO1 Auxiliary Heating sudden decrease x6.4 Temperature on the surface of the blanket and divertor wall graphic.

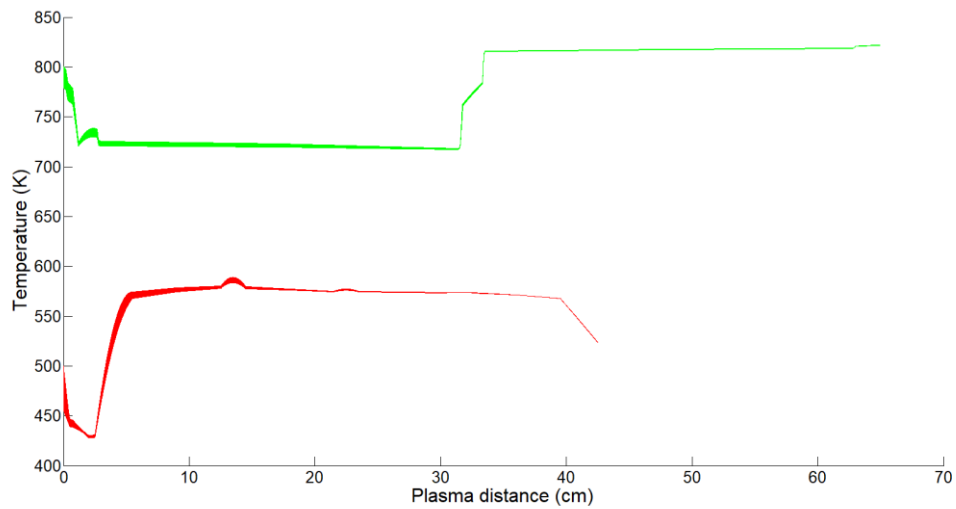


Figure 263: DCLL DEMO1 Auxiliary Heating sudden decrease x6.4 evolution of the BB and divertor temperature graphic.

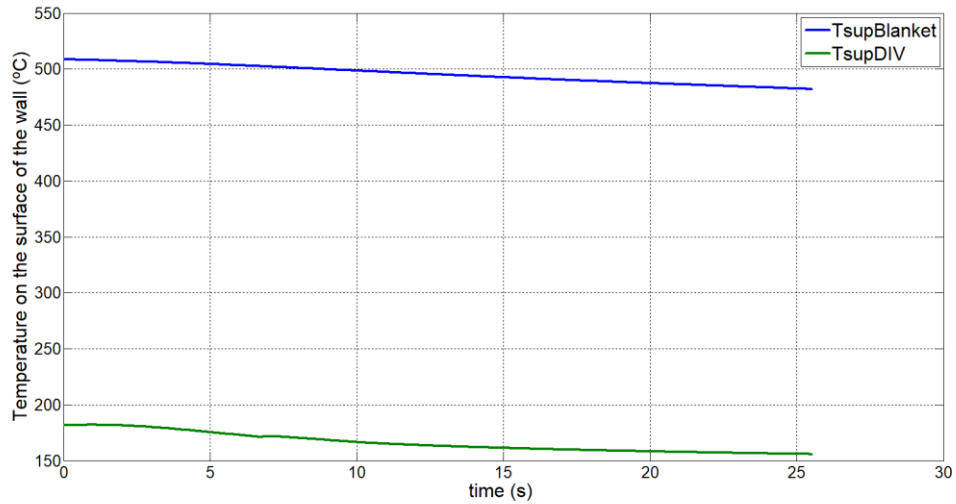


Figure 264: DCLL DEMO1 Fueling Rate Cut-off Temperature on the surface of the blanket and divertor wall graphic.

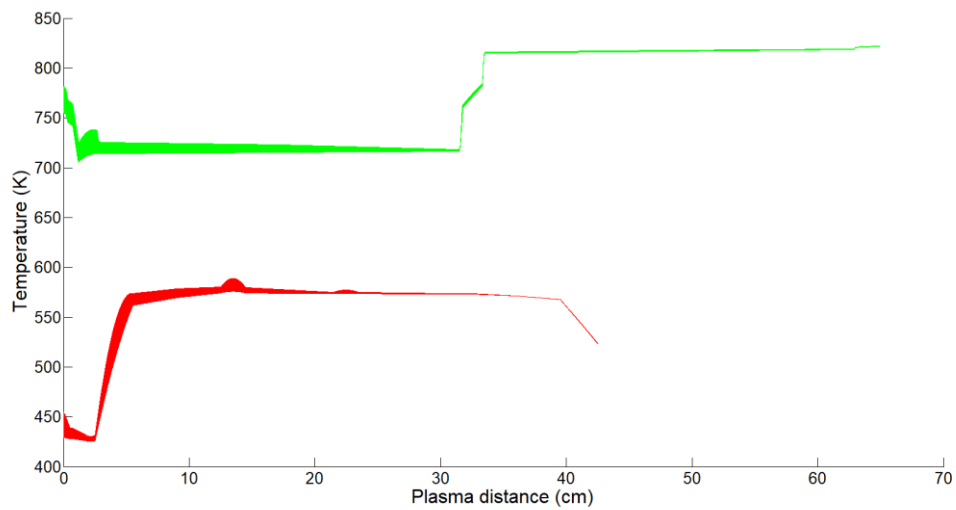


Figure 265: DCLL DEMO1 Fueling Rate Cut-off evolution of the BB and divertor temperature graphic.

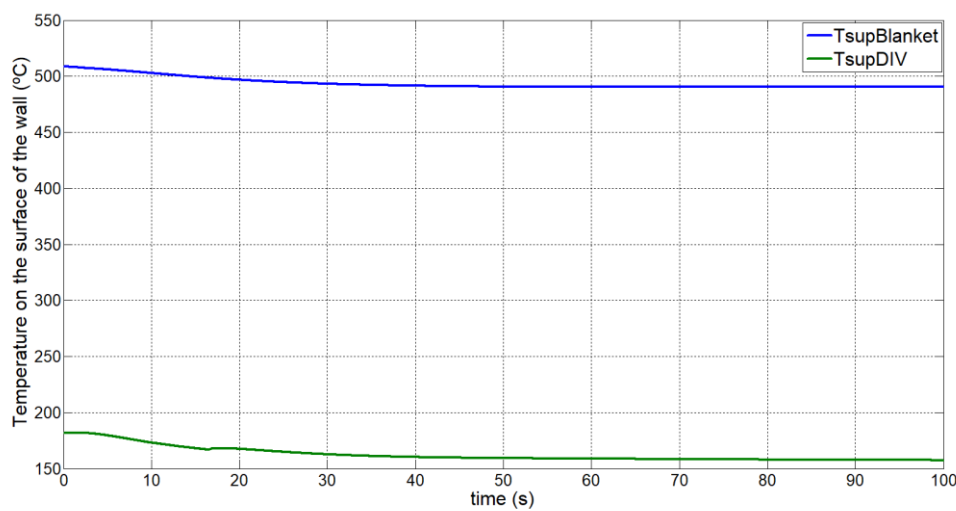


Figure 266: DCLL DEMO1 Fueling Rate sudden decrease x0.5 Temperature on the surface of the blanket and divertor wall graphic.

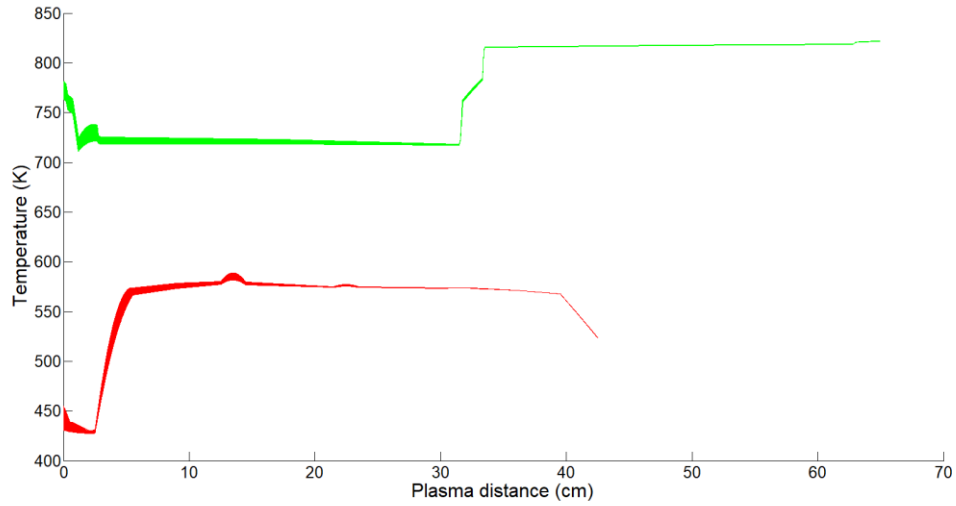


Figure 267: DCLL DEMO1 Fueling Rate sudden decrease x0.5 evolution of the BB and divertor temperature graphic.

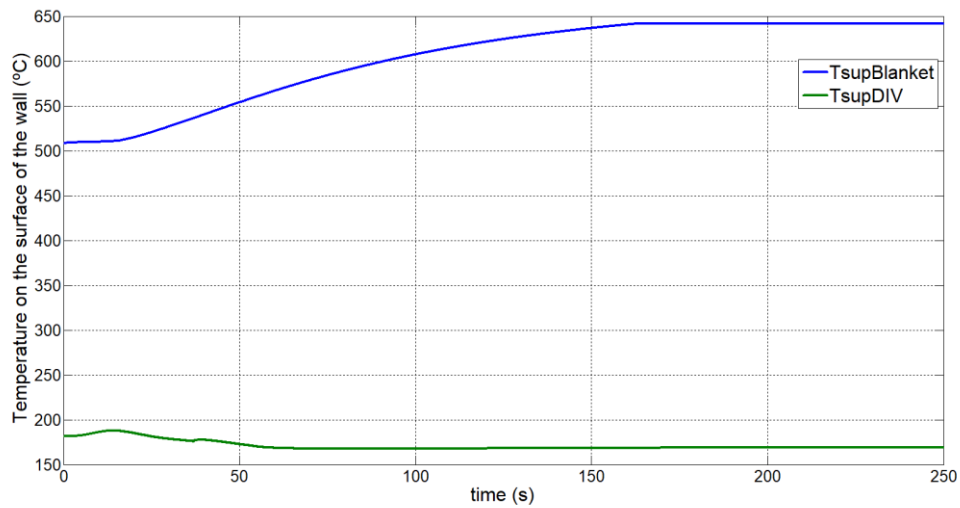


Figure 268: DCLL DEMO1 Fueling Rate sudden increase x1.25 Temperature on the surface of the blanket and divertor wall graphic.

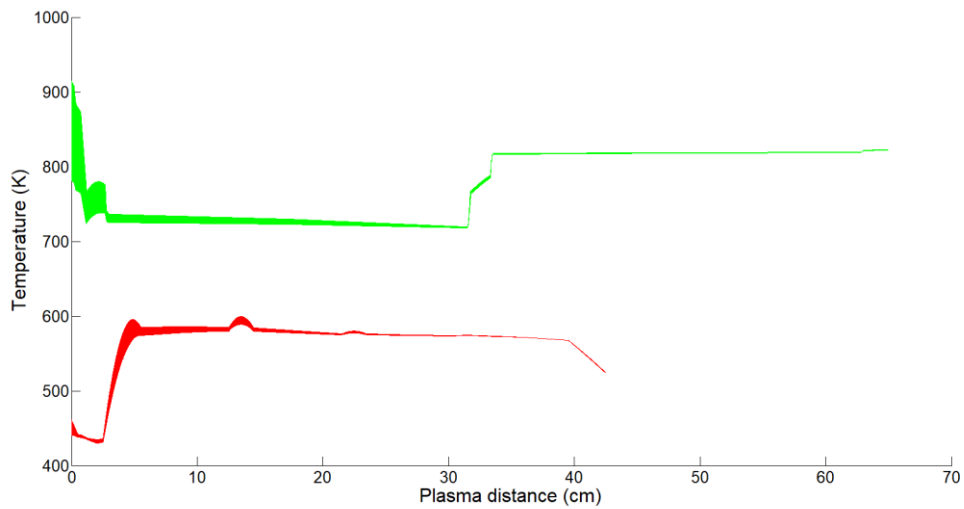


Figure 269: DCLL DEMO1 Fueling Rate sudden increase x1.25 evolution of the BB and divertor temperature graphic.

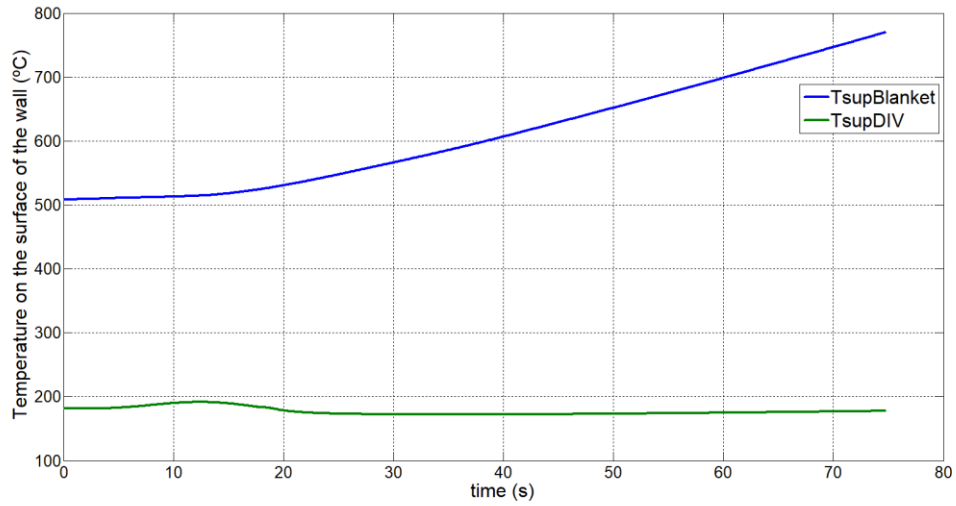


Figure 270: DCLL DEMO1 Fueling Rate sudden increase x1.5 Temperature on the surface of the blanket and divertor wall graphic.

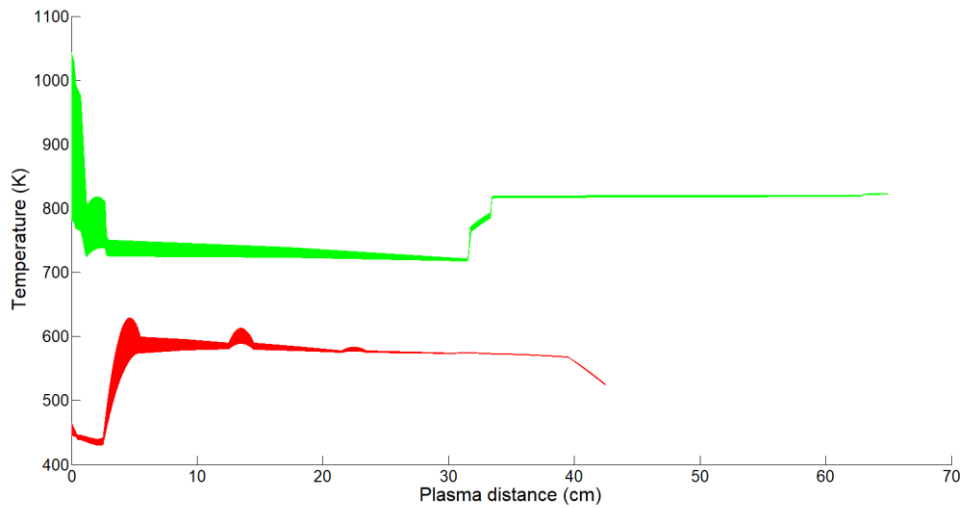


Figure 271: DCLL DEMO1 Fueling Rate sudden increase x1.5 evolution of the BB and divertor temperature graphic.

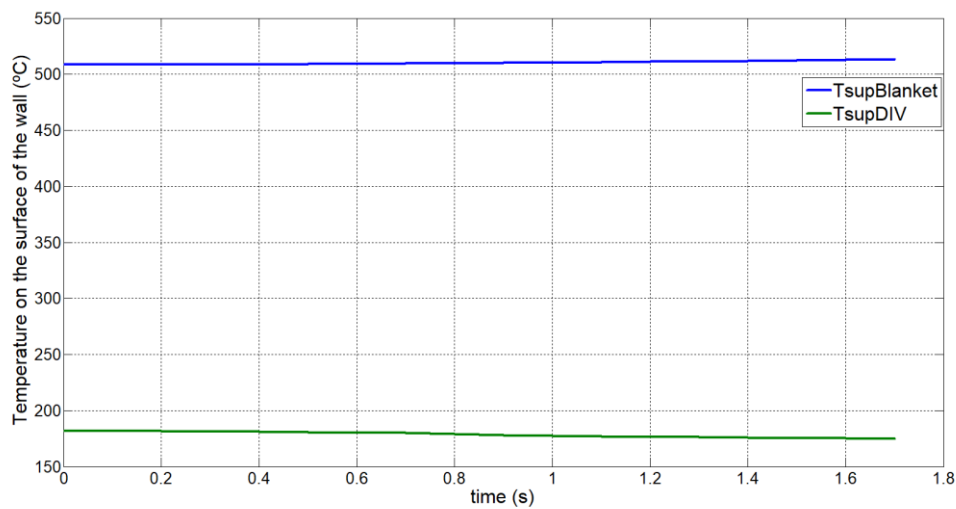


Figure 272: DCLL DEMO1 Fueling Rate sudden increase x6 Temperature on the surface of the blanket and divertor wall graphic.

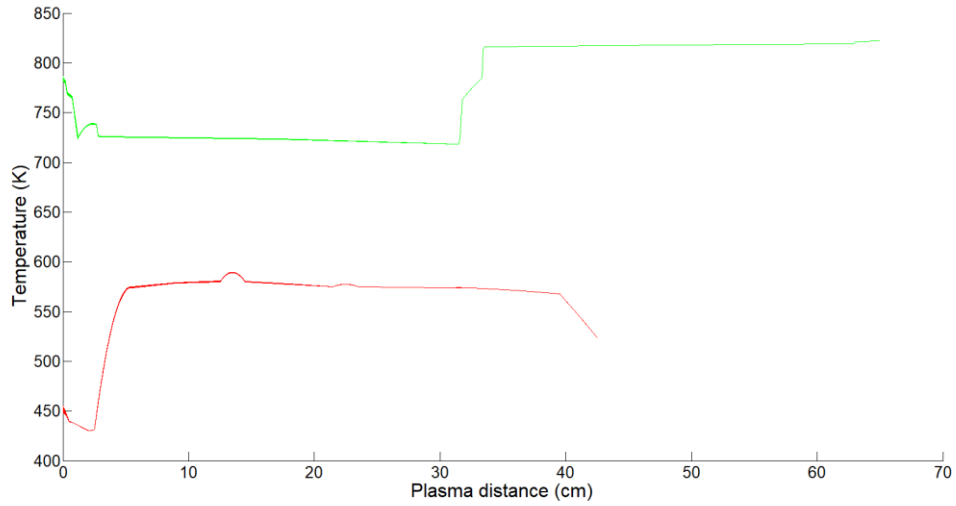


Figure 273: DCLL DEMO1 Fueling Rate sudden increase x6 evolution of the BB and divertor temperature graphic.

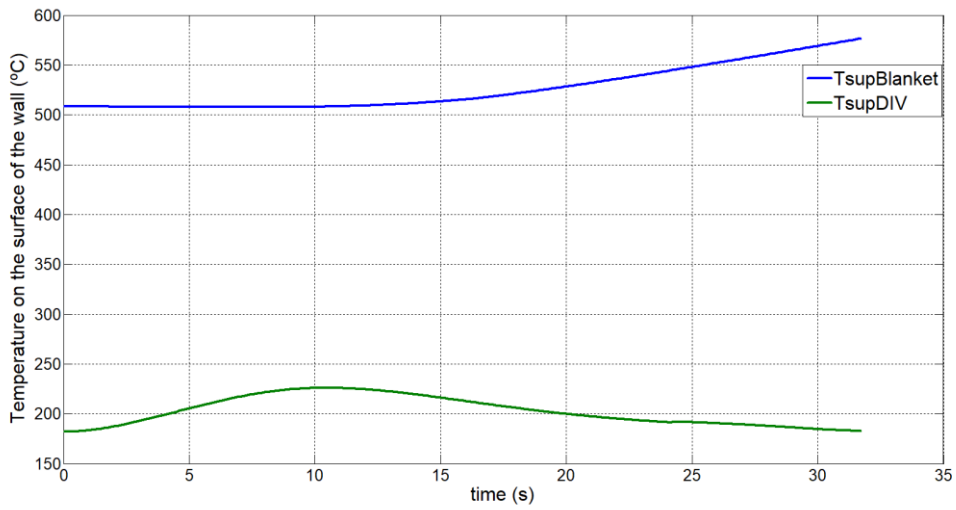


Figure 274: DCLL DEMO1 Confinement time improvement x1.5 Temperature on the surface of the blanket and divertor wall graphic.

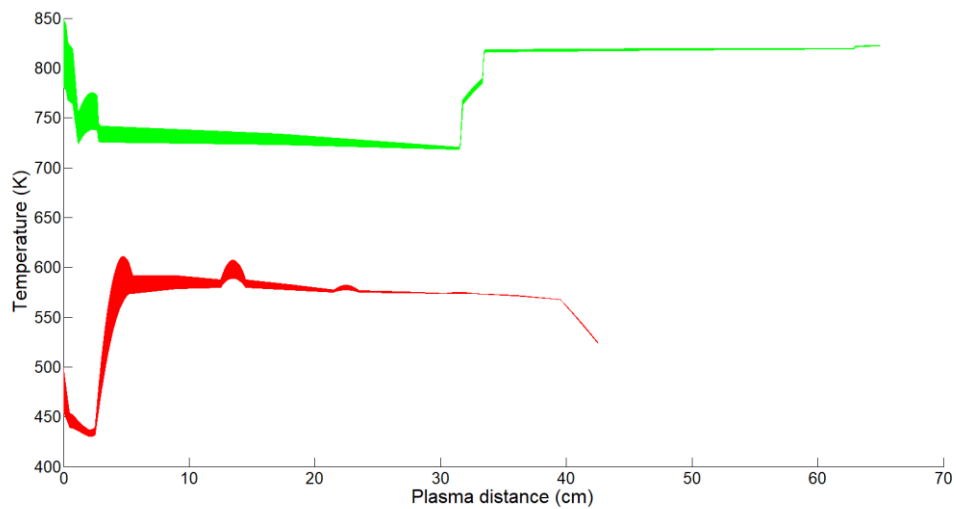


Figure 275: DCLL DEMO1 Confinement time improvement x1.5 evolution of the BB and divertor temperature graphic.

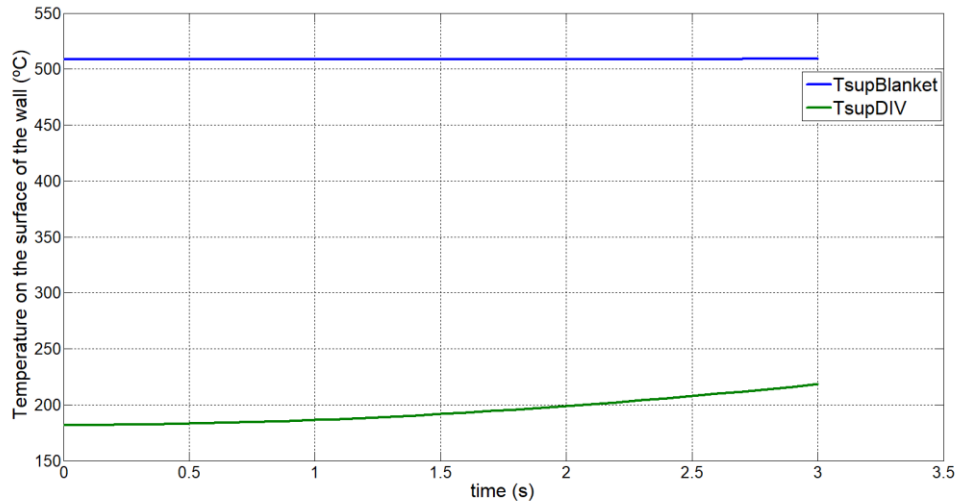


Figure 276: DCLL DEMO1 Confinement time improvement x5 Temperature on the surface of the blanket and divertor wall graphic.

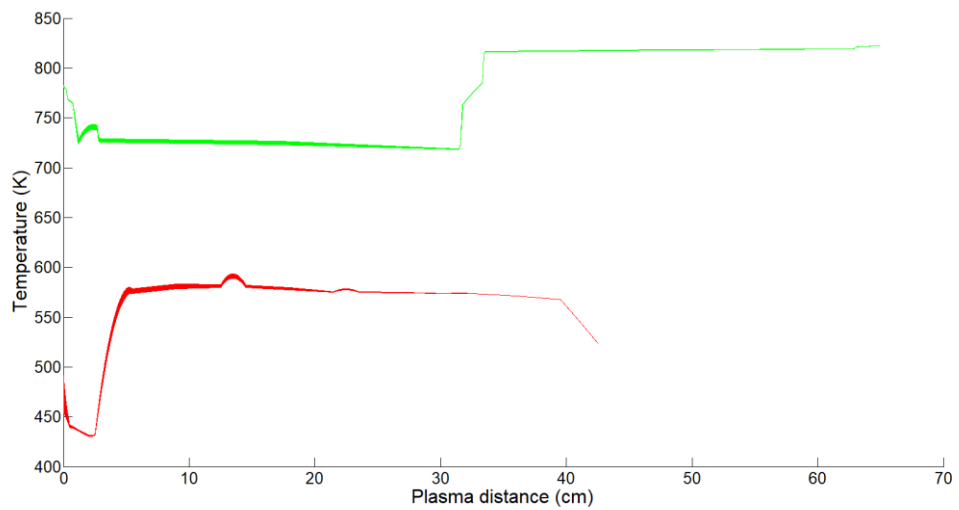


Figure 277: DCLL DEMO1 Confinement time improvement x5 evolution of the BB and divertor temperature graphic.

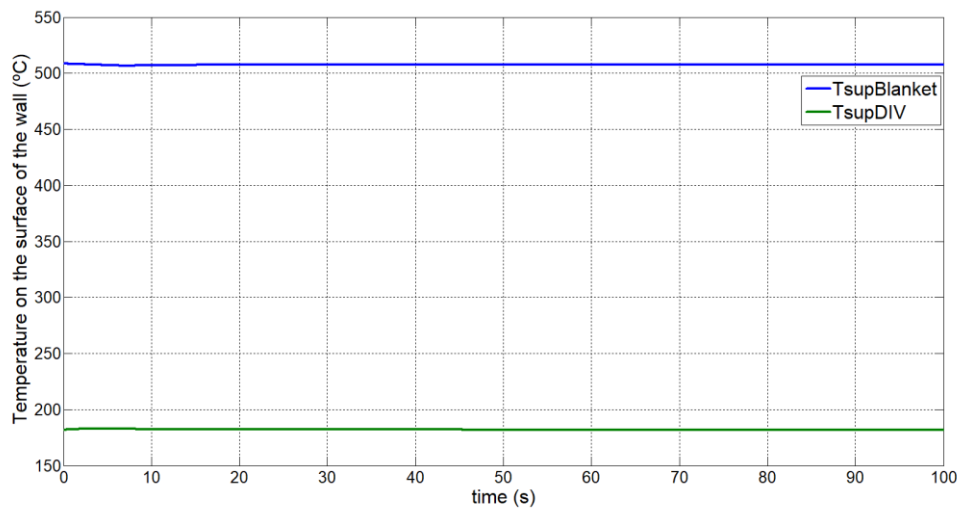


Figure 278: DCLL DEMO1 Occasional confinement time improvement x3 Temperature on the surface of the blanket and divertor wall graphic.

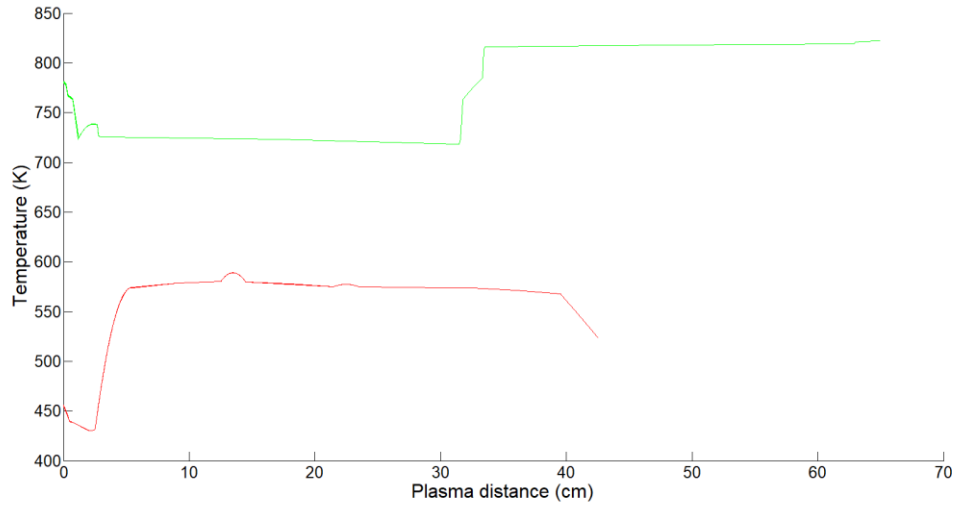


Figure 279: DCLL DEMO1 Occasional confinement time improvement x3 evolution of the BB and divertor temperature graphic.

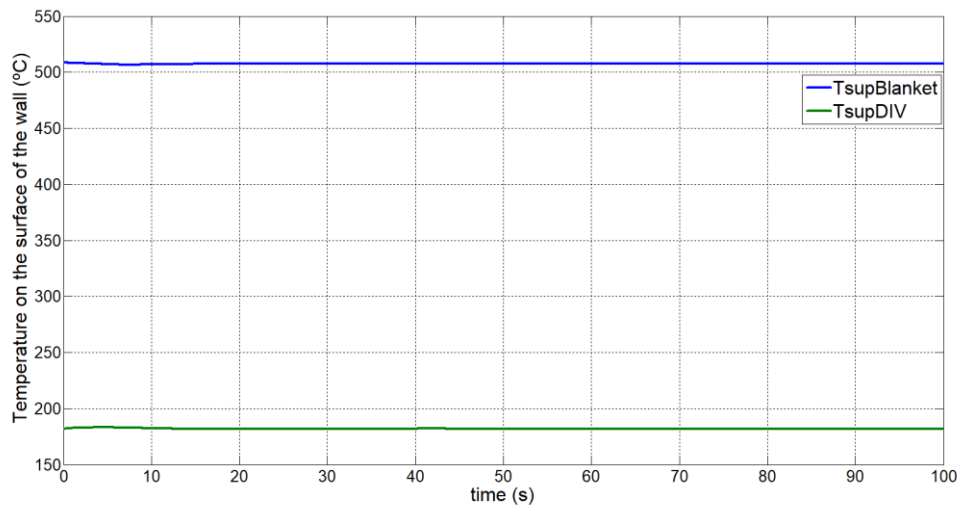


Figure 280: DCLL DEMO1 Occasional confinement time improvement x10 Temperature on the surface of the blanket and divertor wall graphic.

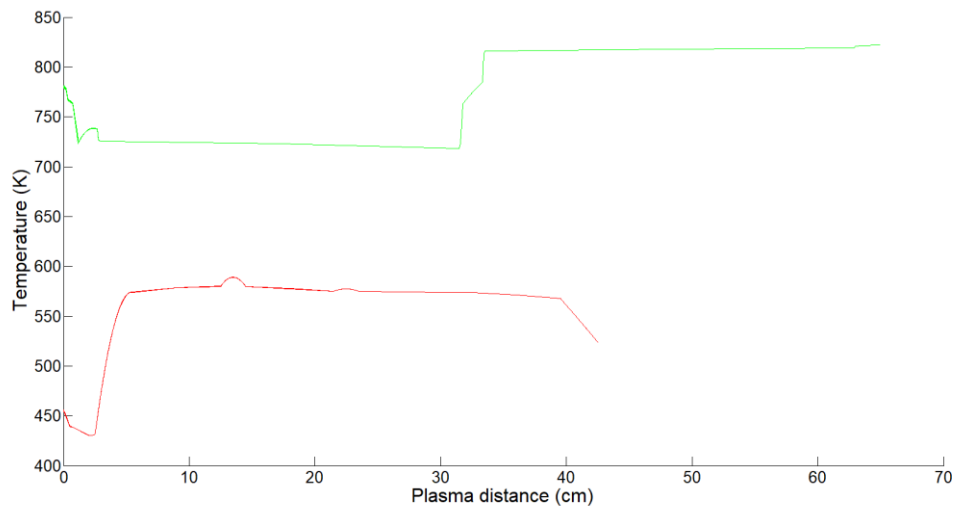


Figure 281: DCLL DEMO1 Occasional confinement time improvement x10 evolution of the BB and divertor temperature graphic.

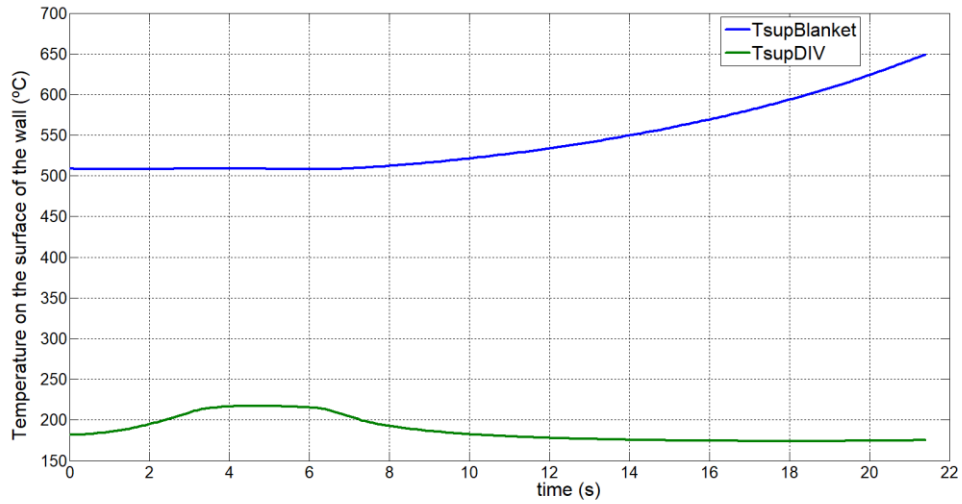


Figure 282: DCLL DEMO1 Occasional confinement time improvement x3 (during 3s) Temperature on the surface of the blanket and divertor wall graphic.

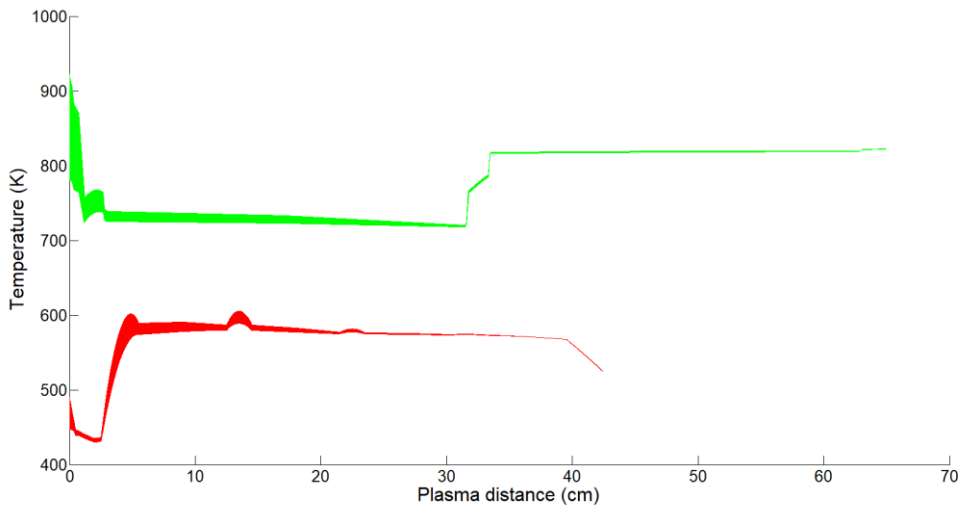


Figure 283: DCLL DEMO1 Occasional confinement time improvement x3 (during 3s) evolution of the BB and divertor temperature graphic.

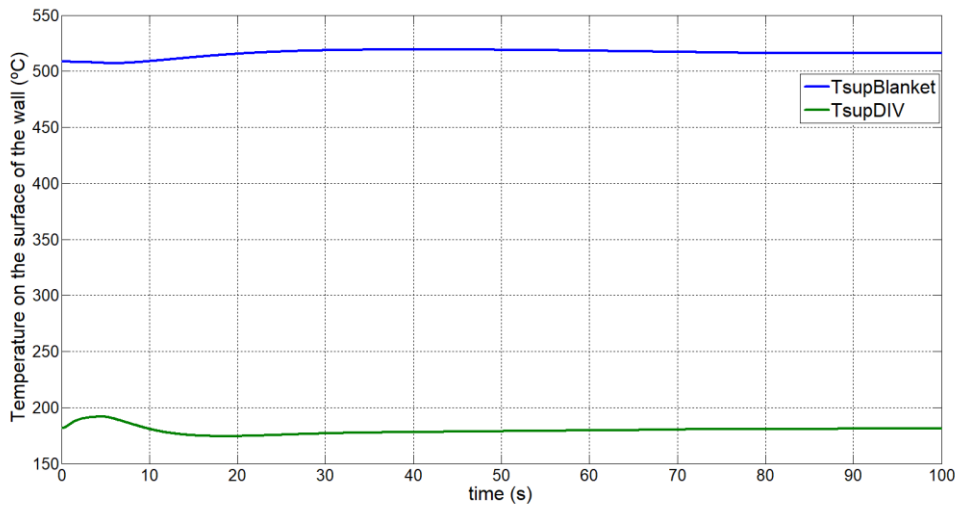


Figure 284: DCLL DEMO1 Occasional confinement time improvement x3 (during 1s) Temperature on the surface of the blanket and divertor wall graphic.



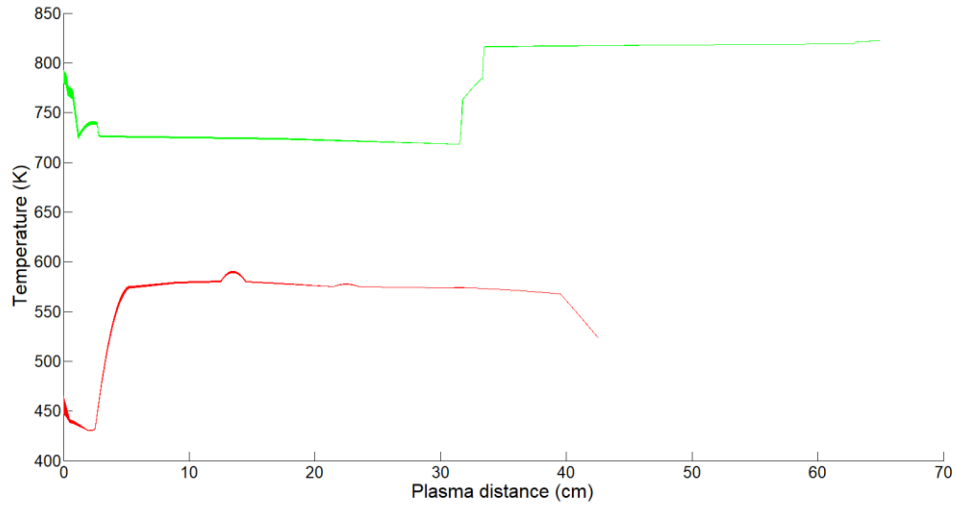


Figure 285: DCLL DEMO1 Occasional confinement time improvement x3 (during 1s) evolution of the BB and divertor temperature graphic.

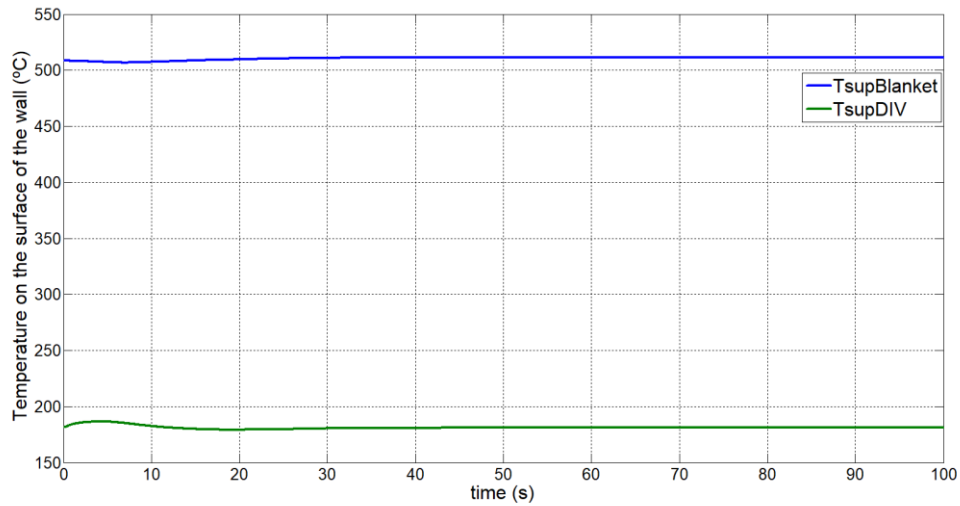


Figure 286: DCLL DEMO1 Occasional confinement time improvement x3 (during 0.5s) Temperature on the surface of the blanket and divertor wall graphic.

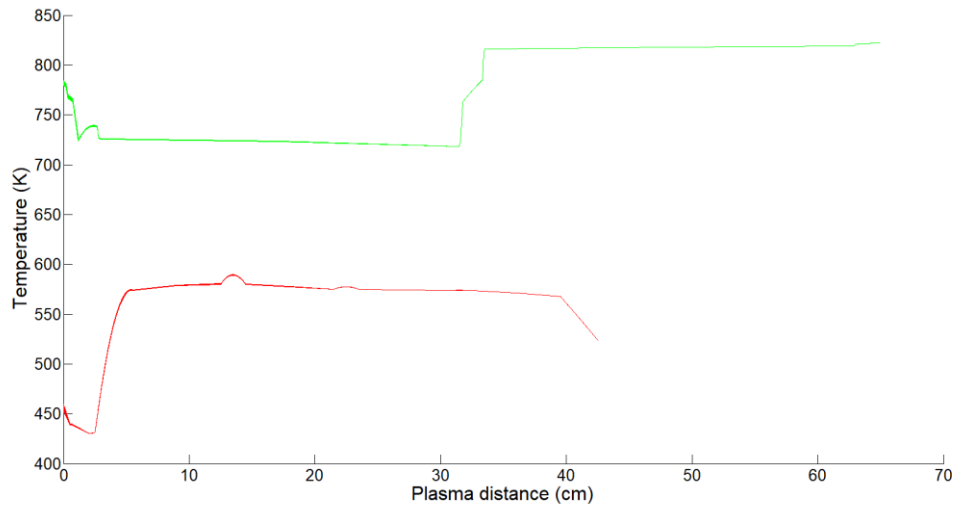


Figure 287: DCLL DEMO1 Occasional confinement time improvement x3 (during 0.5s) evolution of the BB and divertor temperature graphic.

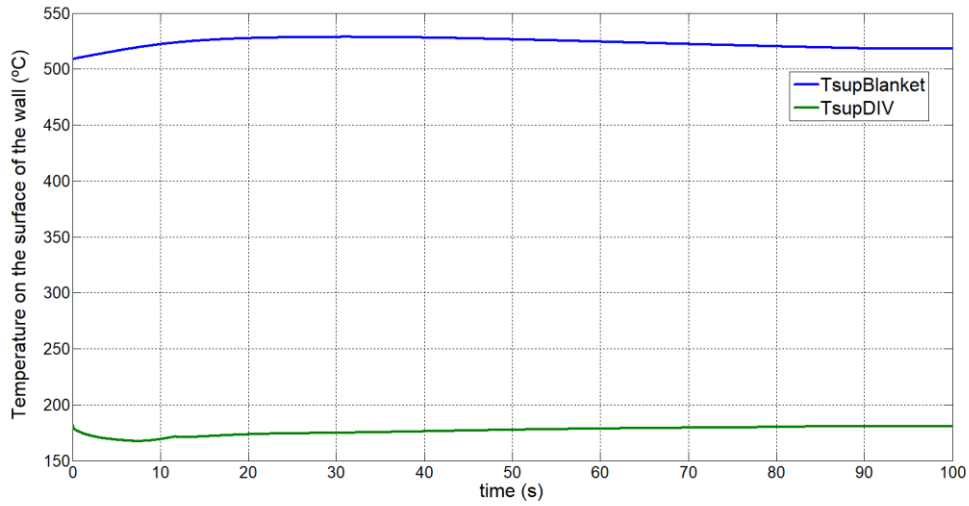


Figure 288: DCLL DEMO1 Punctual impurities entrance x1.5 Temperature on the surface of the blanket and divertor wall graphic.

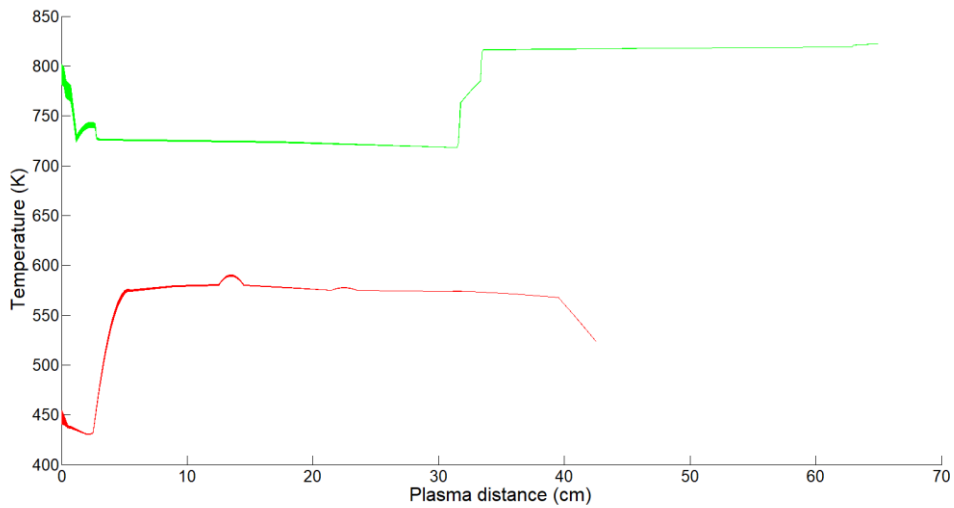


Figure 289: DCLL DEMO1 Punctual impurities entrance x1.5 evolution of the BB and divertor temperature graphic.

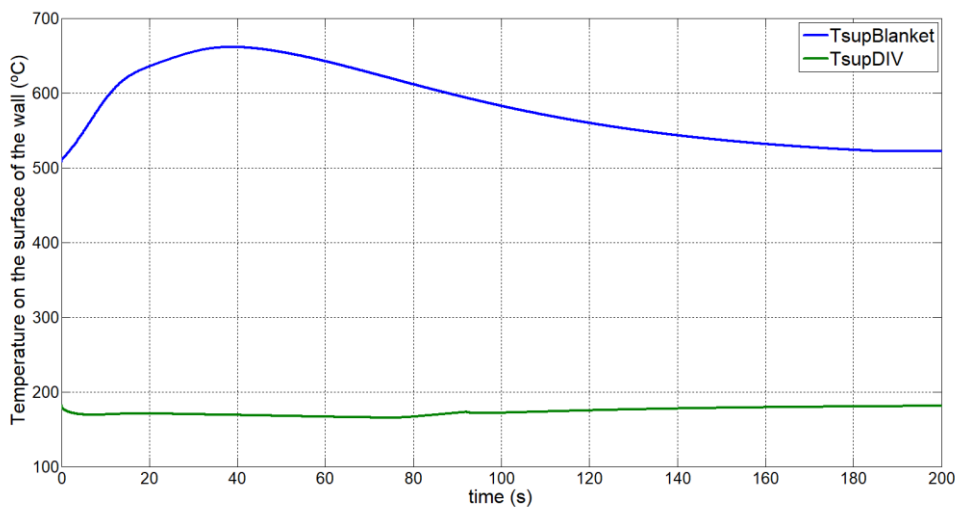


Figure 290: DCLL DEMO1 Punctual impurities entrance x2.9 Temperature on the surface of the blanket and divertor wall graphic.

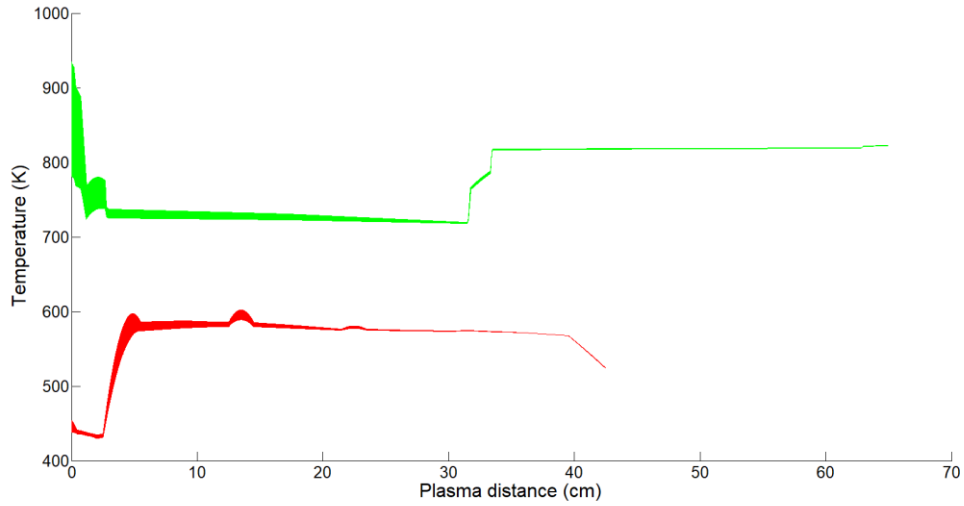


Figure 291: DCLL DEMO1 Punctual impurities entrance x2.9 evolution of the BB and divertor temperature graphic.

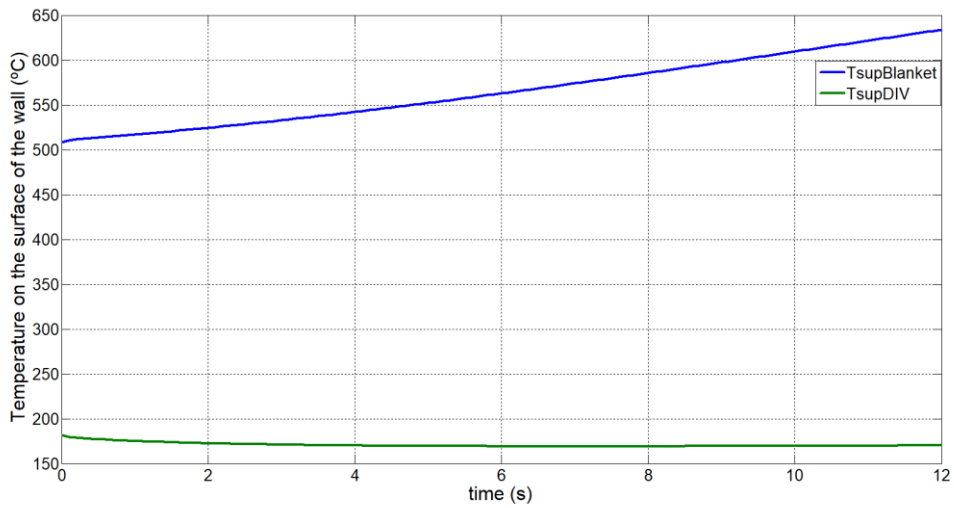


Figure 292: DCLL DEMO1 Punctual impurities entrance x3 Temperature on the surface of the blanket and divertor wall graphic.

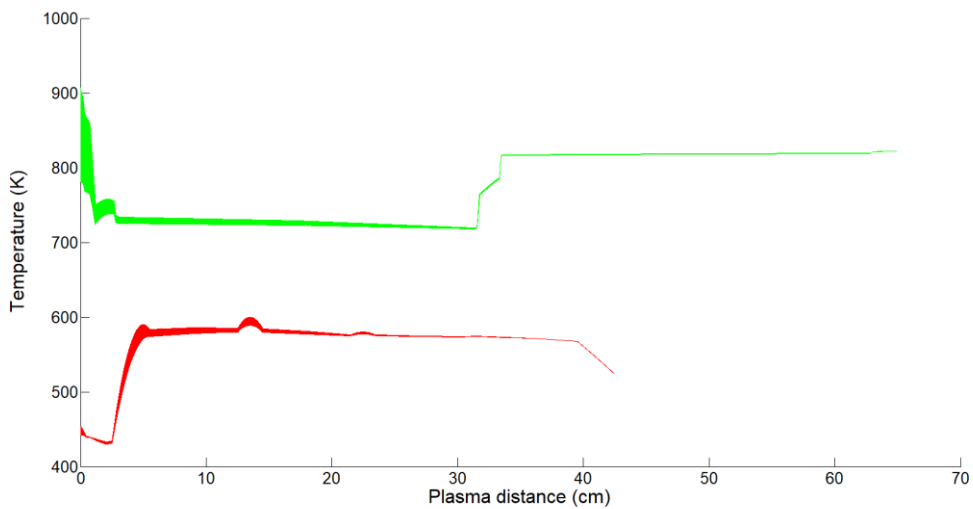


Figure 293: DCLL DEMO1 Punctual impurities entrance x3 evolution of the BB and divertor temperature graphic.

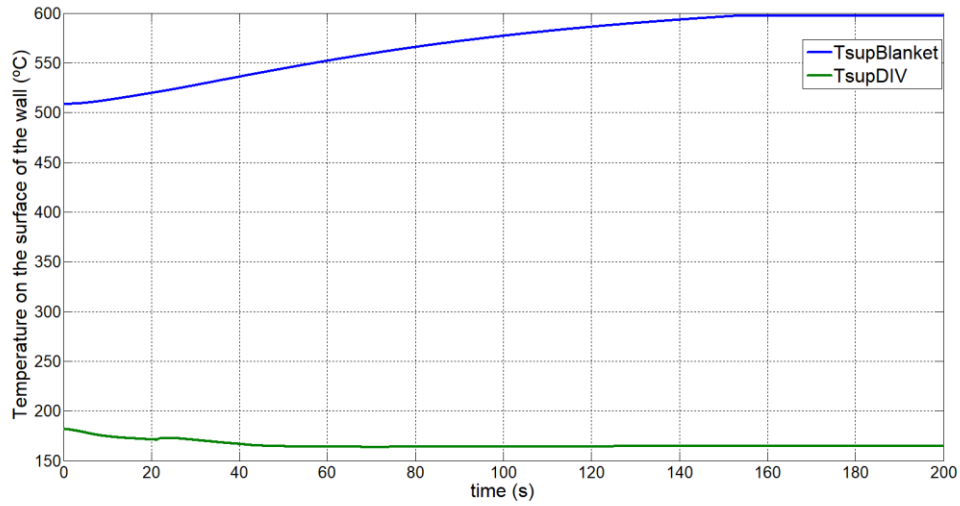


Figure 294: DCLL DEMO1 Tungsten permanent entrance x4 Temperature on the surface of the blanket and divertor wall graphic.

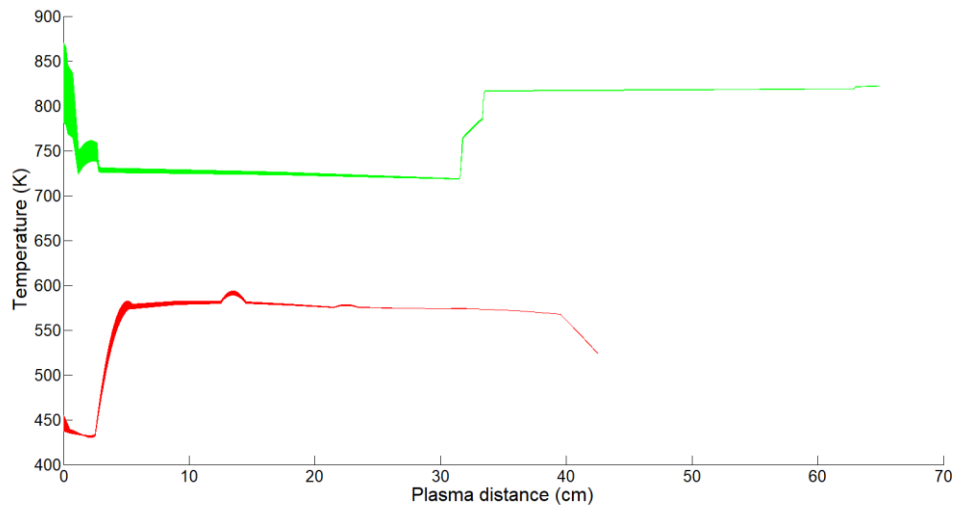


Figure 295: DCLL DEMO1 Tungsten permanent entrance x4 evolution of the BB and divertor temperature graphic.

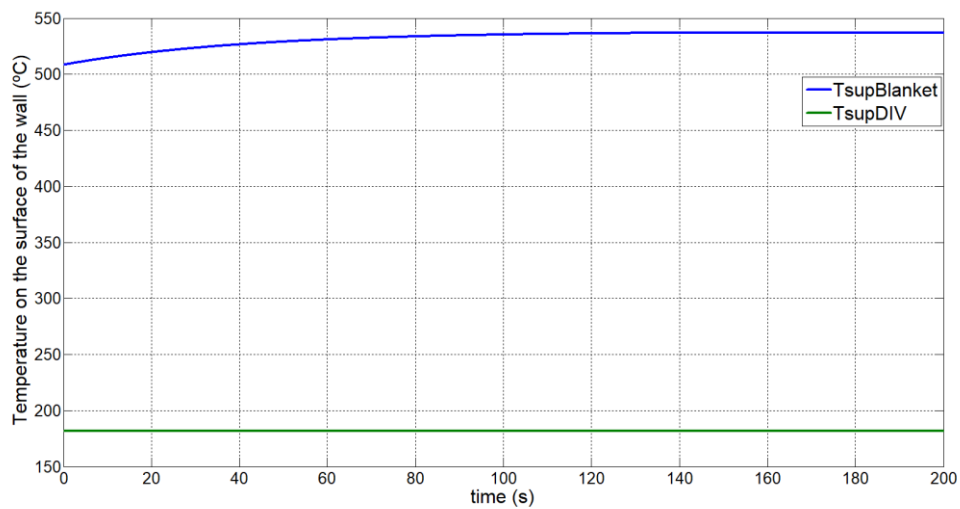


Figure 296: DCLL DEMO1 BB LOCA 30% in all the cooling loops (FW and PbLi channels). Temperature on the surface of the blanket and divertor wall graphic.

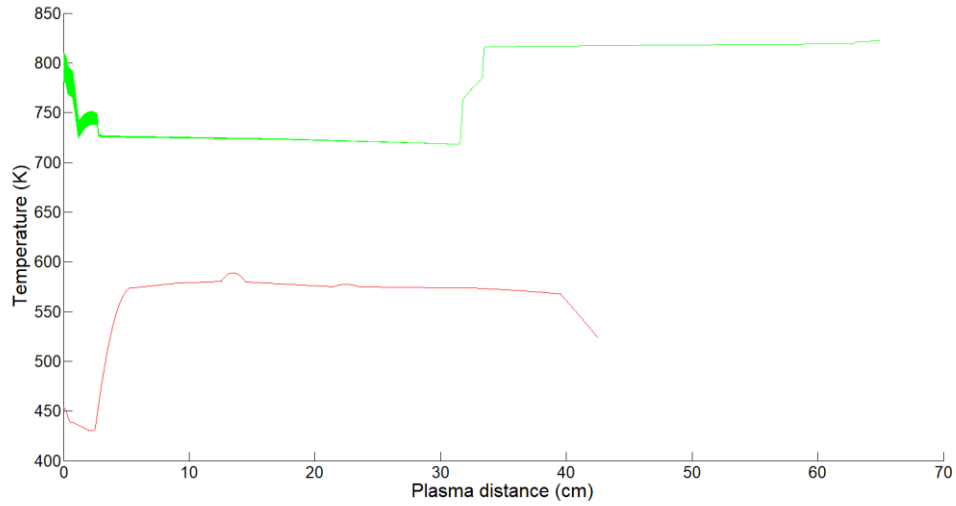


Figure 297: DCLL DEMO1 BB LOCA 30% in all the cooling loops (FW and PbLi channels). Evolution of the BB and divertor temperature graphic.

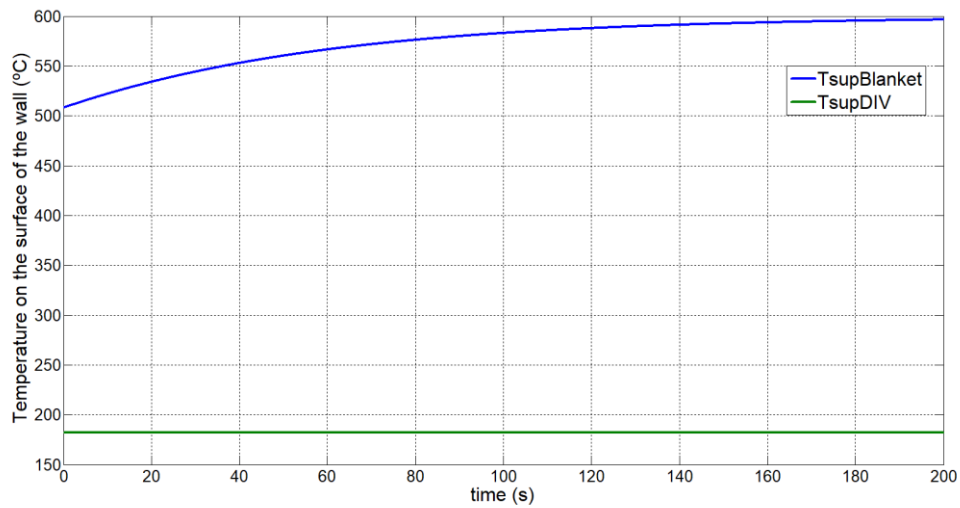


Figure 298: DCLL DEMO1 BB LOCA 60% in all the cooling loops (FW and PbLi channels). Temperature on the surface of the blanket and divertor wall graphic.

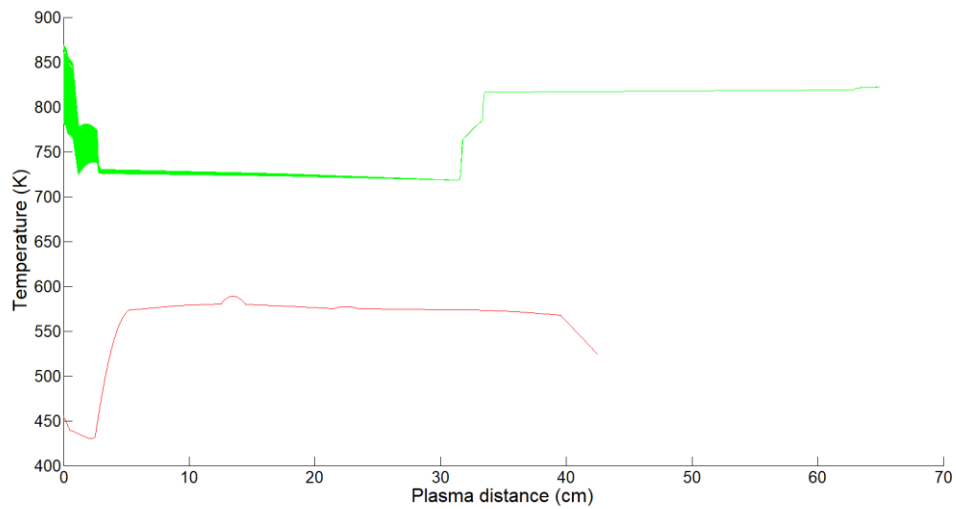


Figure 299: DCLL DEMO1 BB LOCA 60% in all the cooling loops (FW and PbLi channels). Evolution of the BB and divertor temperature graphic.

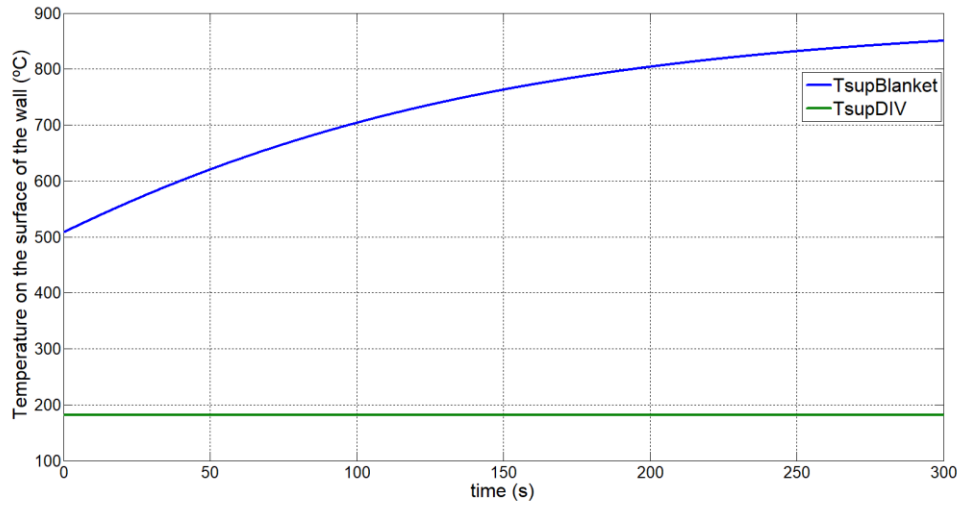


Figure 300: DCLL DEMO1 BB LOCA 90% in all the cooling loops (FW and PbLi channels). Temperature on the surface of the blanket and divertor wall graphic.

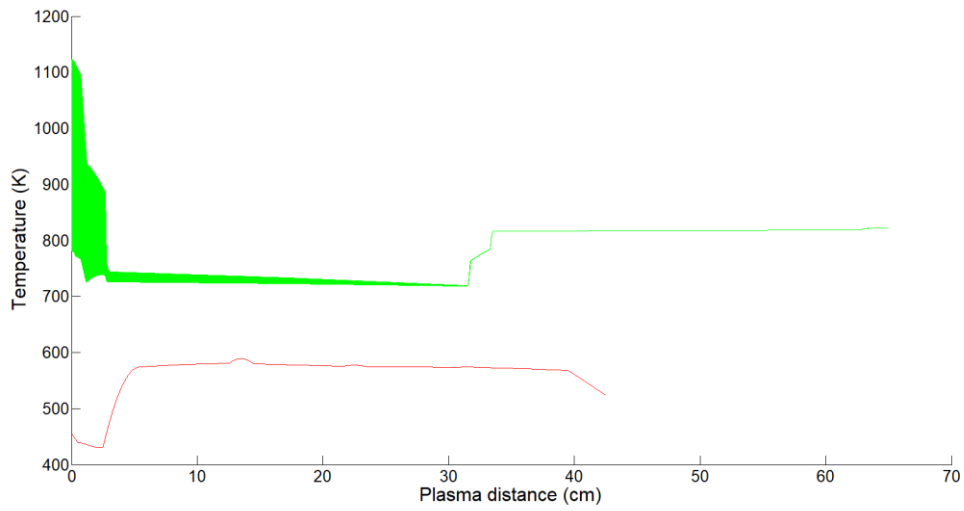


Figure 301: DCLL DEMO1 BB LOCA 90% in all the cooling loops (FW and PbLi channels). Evolution of the BB and divertor temperature graphic.

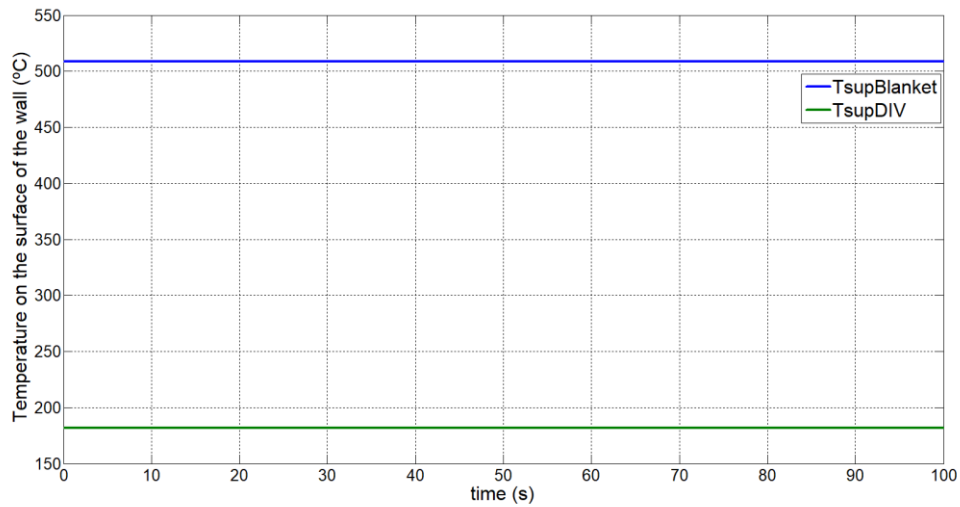


Figure 302: DCLL DEMO1 BB LOCA 90% in the PbLi channels. Temperature on the surface of the blanket and divertor wall graphic.

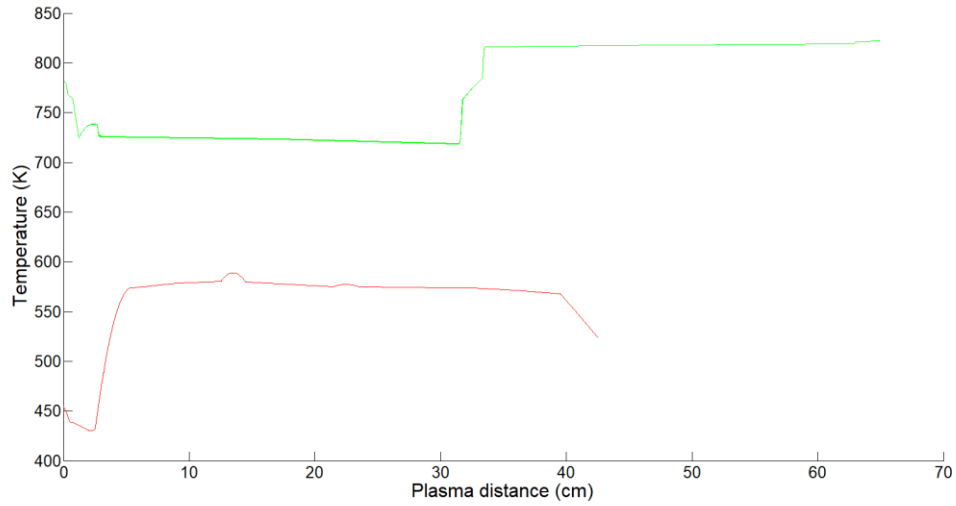


Figure 303: DCLL DEMO1 BB LOCA 90% in the PbLi channels. Evolution of the BB and divertor temperature graphic.

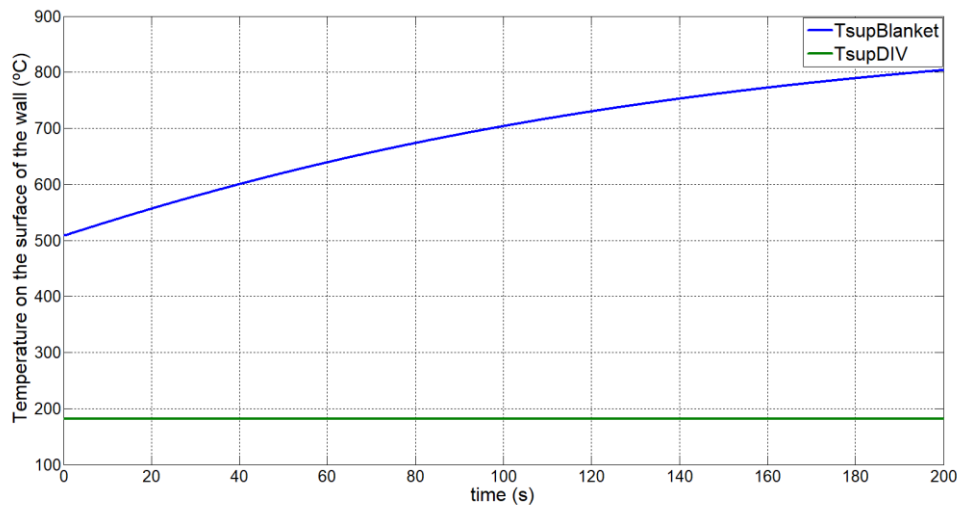


Figure 304: DCLL DEMO1 BB LOCA 90% in the FW cooling loop. Temperature on the surface of the blanket and divertor wall graphic.

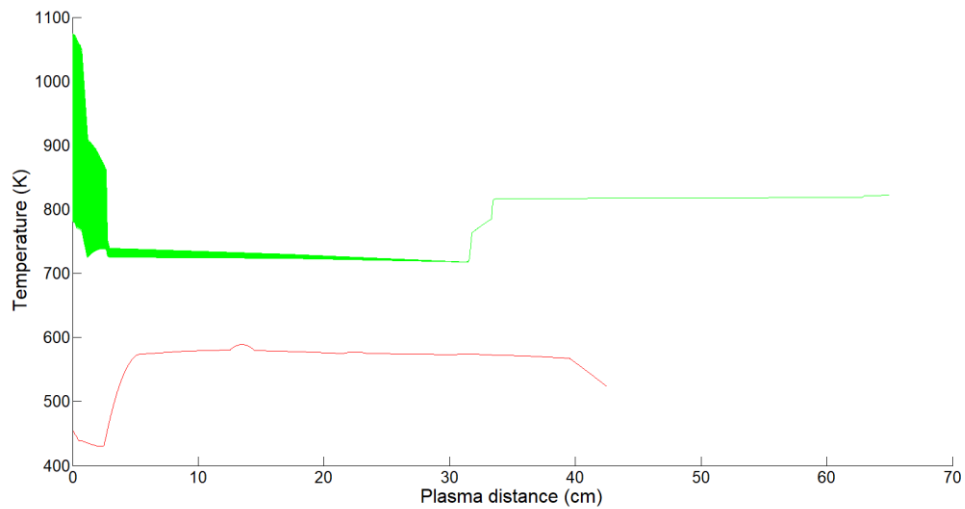


Figure 305: DCLL DEMO1 BB LOCA 90% in the FW cooling loop. Evolution of the BB and divertor temperature graphic.

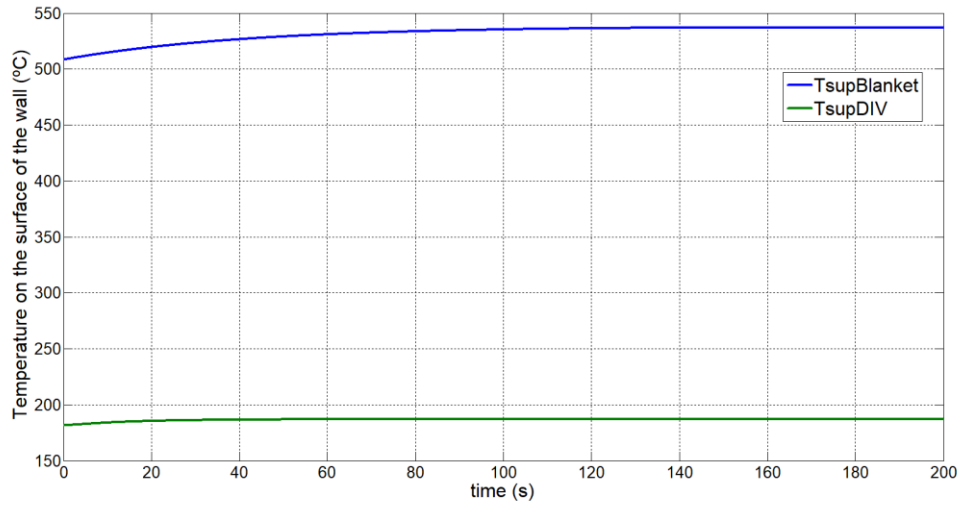


Figure 306: DCLL DEMO1 Divertor and BB LOCA 30% in all the cooling loops. Temperature on the surface of the blanket and divertor wall graphic.

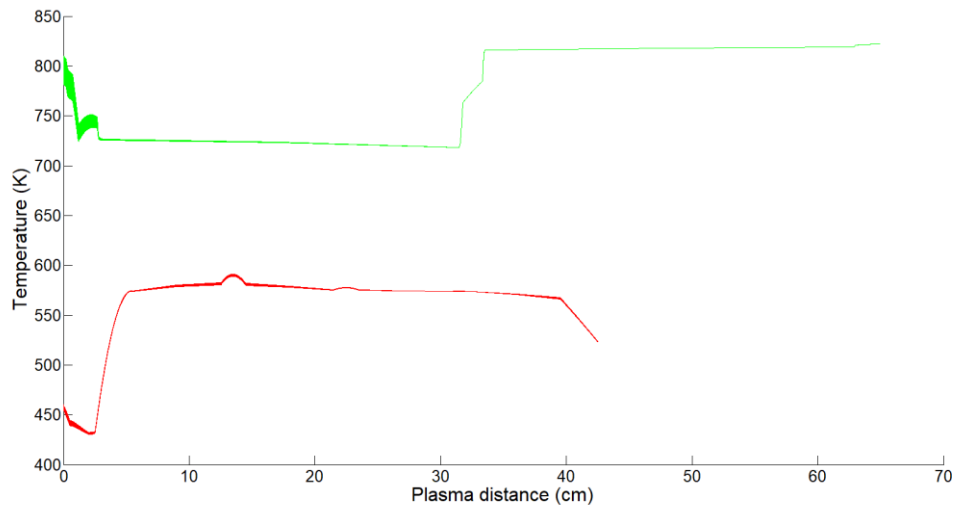


Figure 307: DCLL DEMO1 Divertor and BB LOCA 30% in all the cooling loops. Evolution of the BB and divertor temperature graphic.

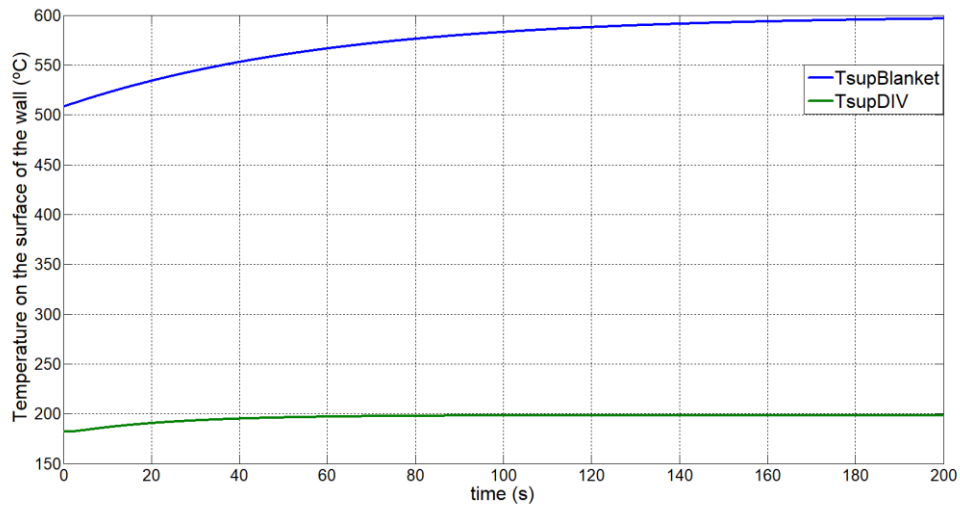


Figure 308: DCLL DEMO1 Divertor and BB LOCA 60% in all the cooling loops. Temperature on the surface of the blanket and divertor wall graphic.



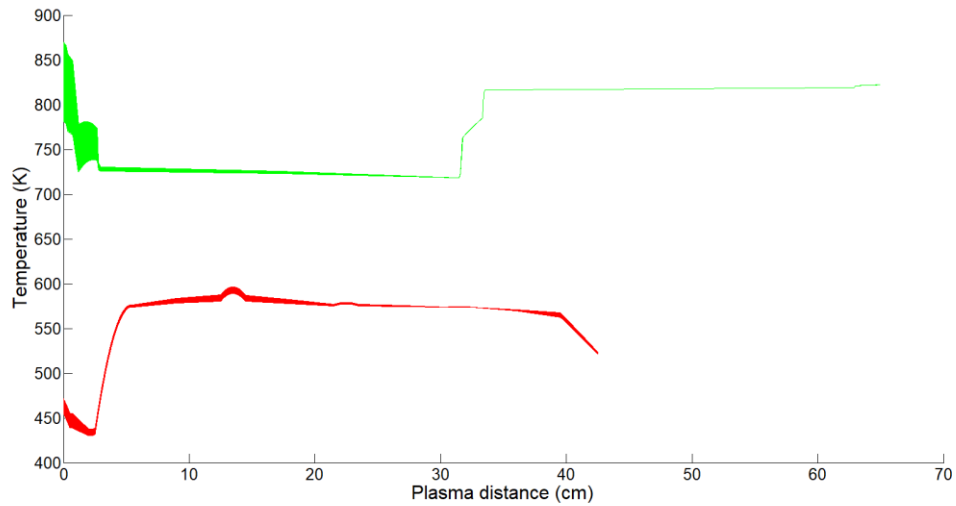


Figure 309: DCLL DEMO1 Divertor and BB LOCA 60% in all the cooling loops. Evolution of the BB and divertor temperature graphic.

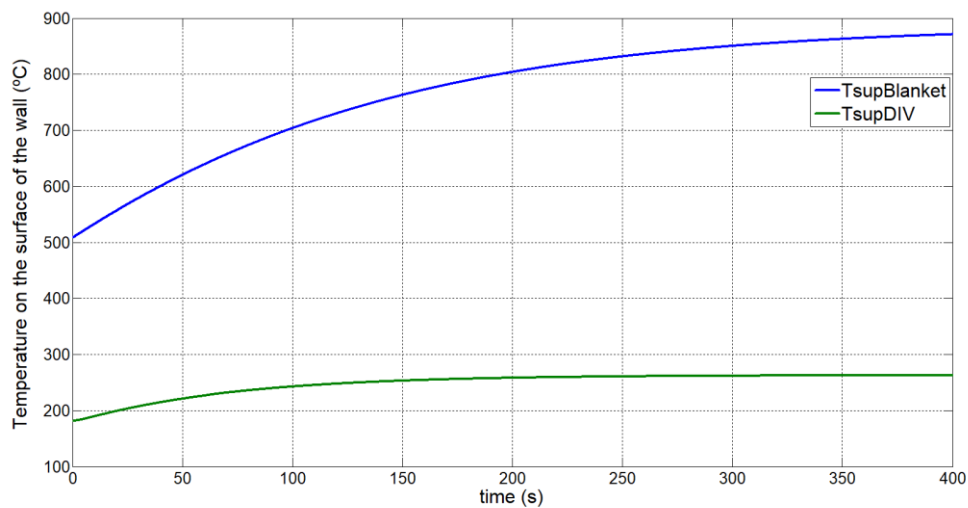


Figure 310: DCLL DEMO1 Divertor and BB LOCA 90% in all the cooling loops. Temperature on the surface of the blanket and divertor wall graphic.

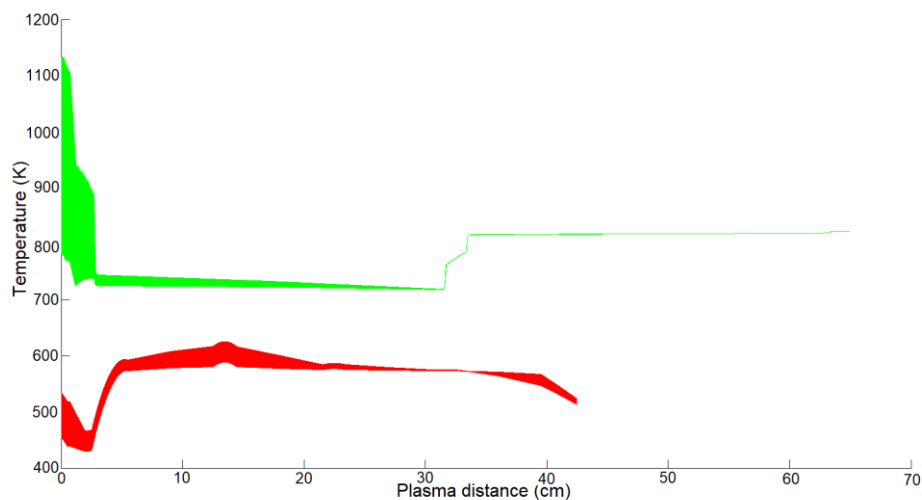


Figure 311: DCLL DEMO1 Divertor and BB LOCA 90% in all the cooling loops. Evolution of the BB and divertor temperature graphic.

## ANNEX C: HCLL graphics

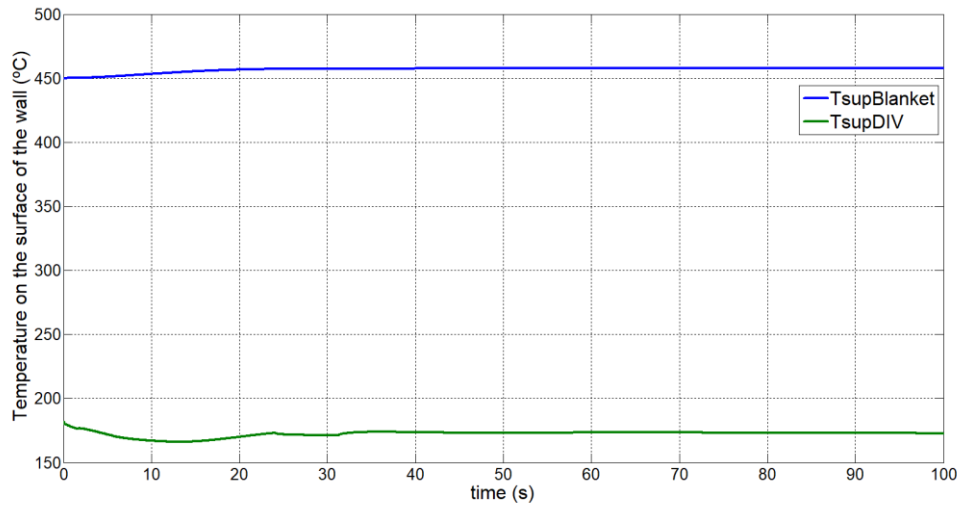


Figure 312: HCLL DEMO1 Auxiliary Heating Cut-off T on the surface of the blanket and divertor wall graphic.

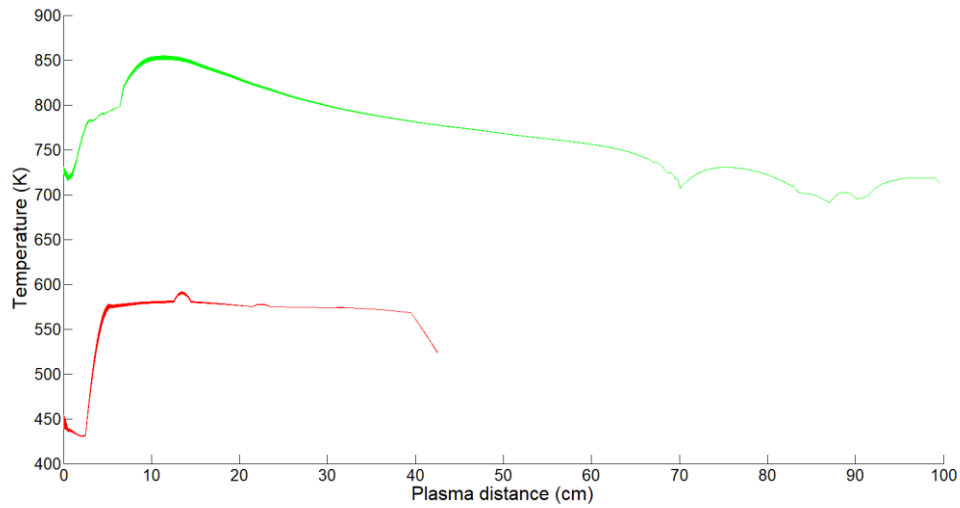


Figure 313: HCLL DEMO1 Auxiliary Heating Cut-off evolution of the BB and divertor temperature graphic.

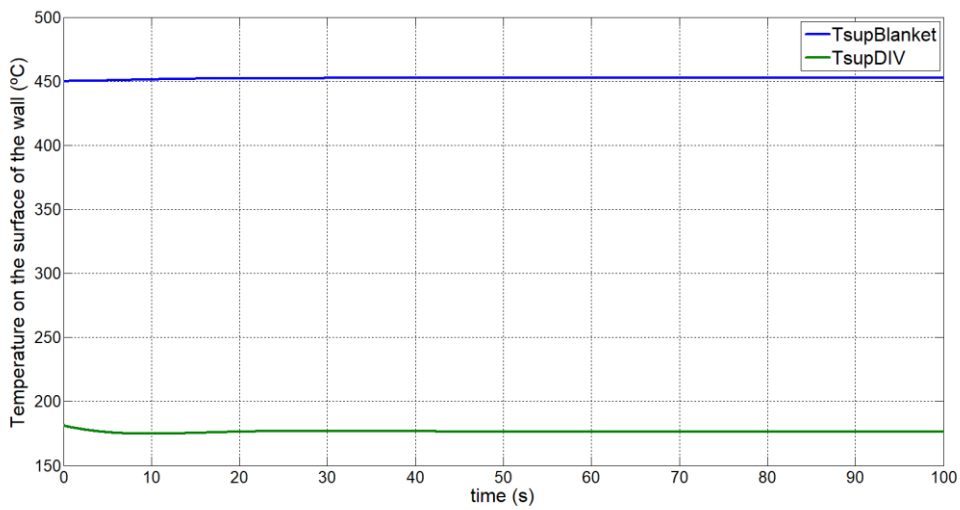


Figure 314: HCLL DEMO1 Auxiliary Heating sudden decrease x0.5 Temperature on the surface of the blanket and divertor wall graphic.

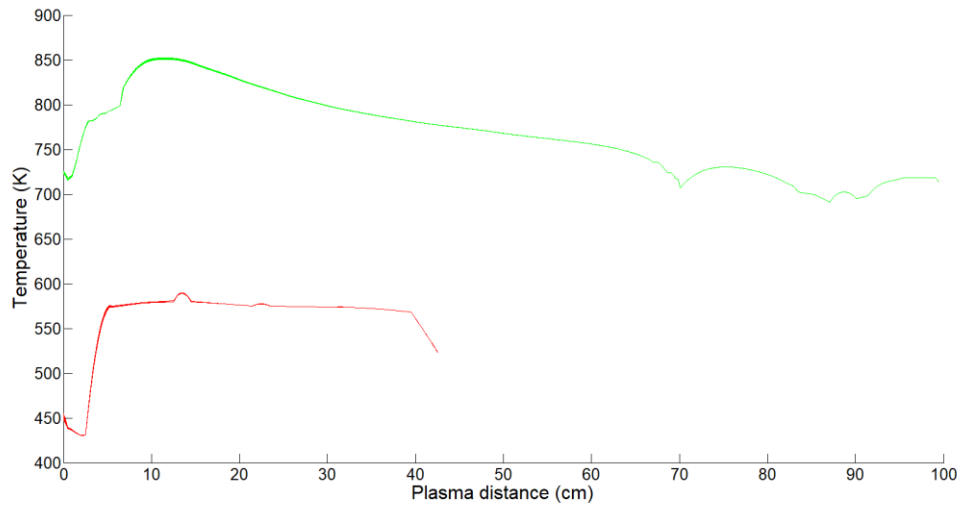


Figure 315: HCLL DEMO1 Auxiliary Heating sudden decrease x0.5 evolution of the BB and divertor temperature graphic.

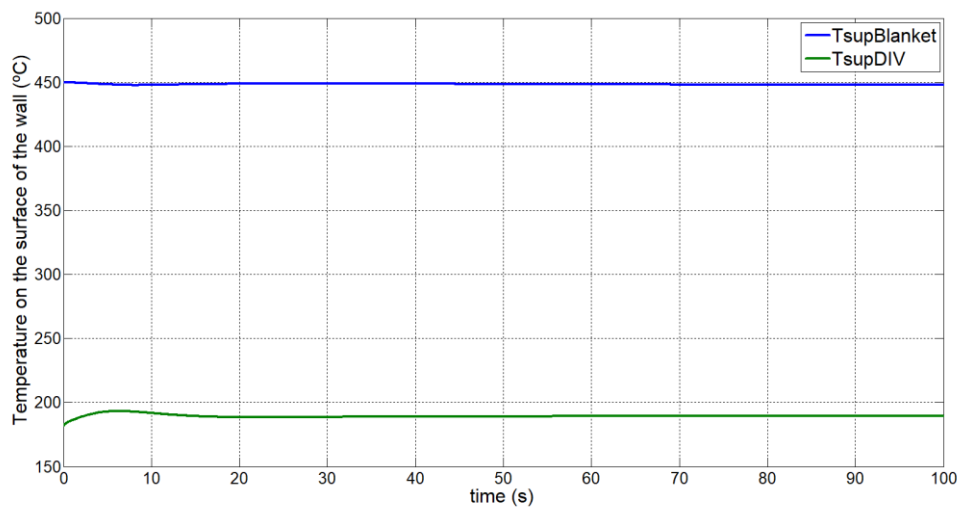


Figure 316: HCLL DEMO1 Auxiliary Heating sudden increase x2 Temperature on the surface of the blanket and divertor wall graphic.

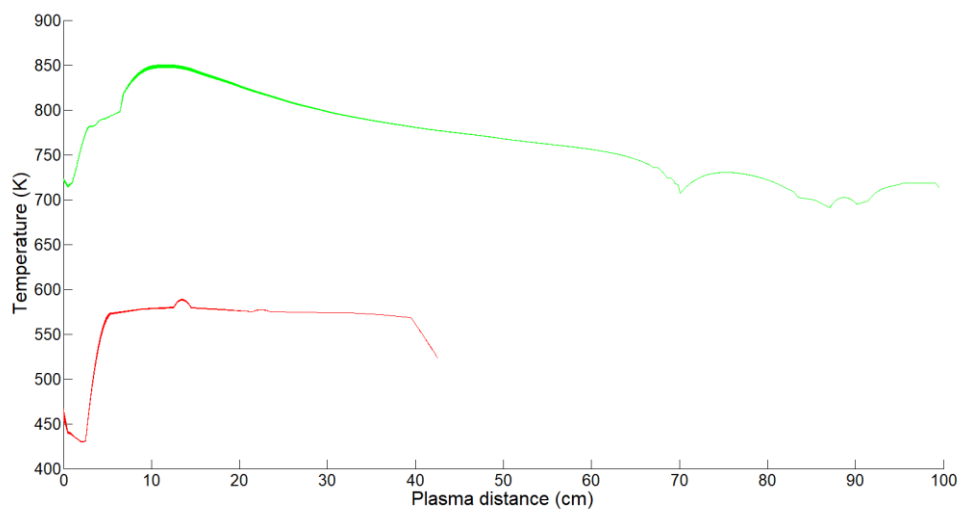


Figure 317: HCLL DEMO1 Auxiliary Heating sudden increase x2 evolution of the BB and divertor temperature graphic.

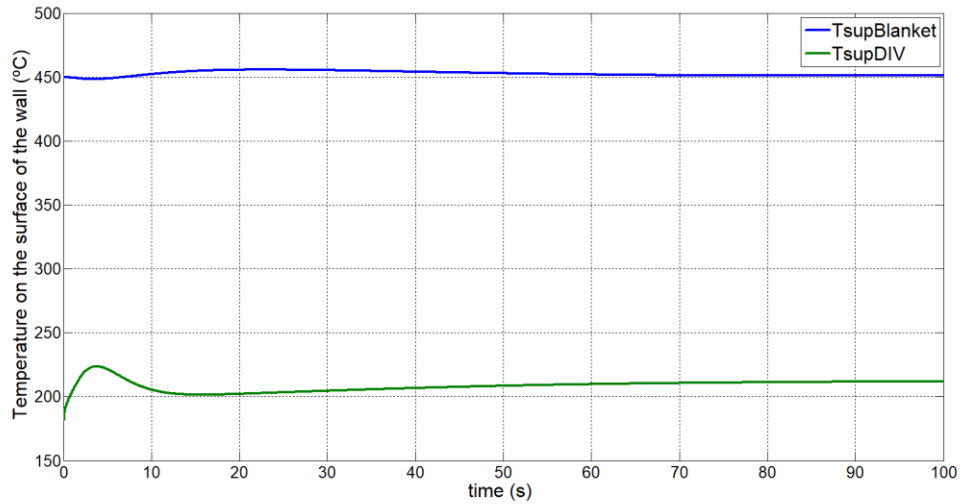


Figure 318: HCLL DEMO1 Auxiliary Heating sudden increase x6 Temperature on the surface of the blanket and divertor wall graphic.

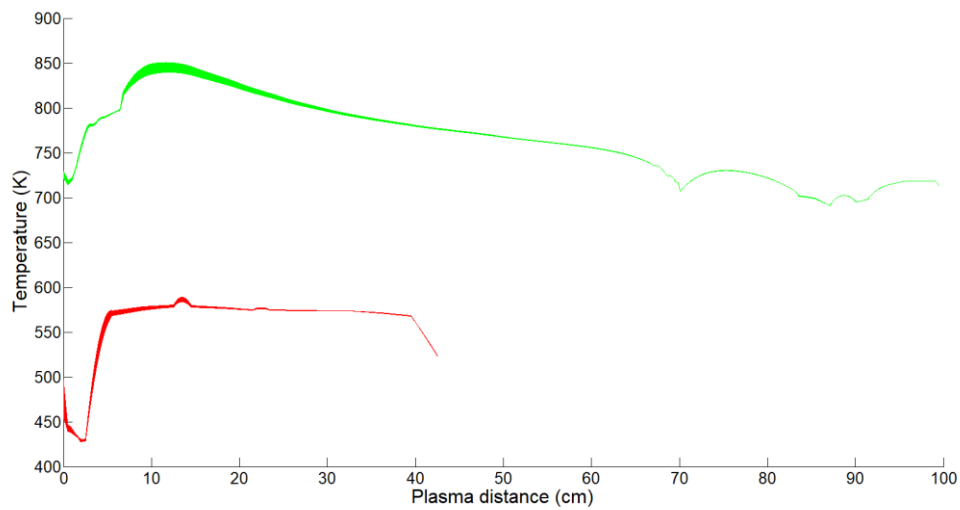


Figure 319: HCLL DEMO1 Auxiliary Heating sudden increase x6 evolution of the BB and divertor temperature graphic.

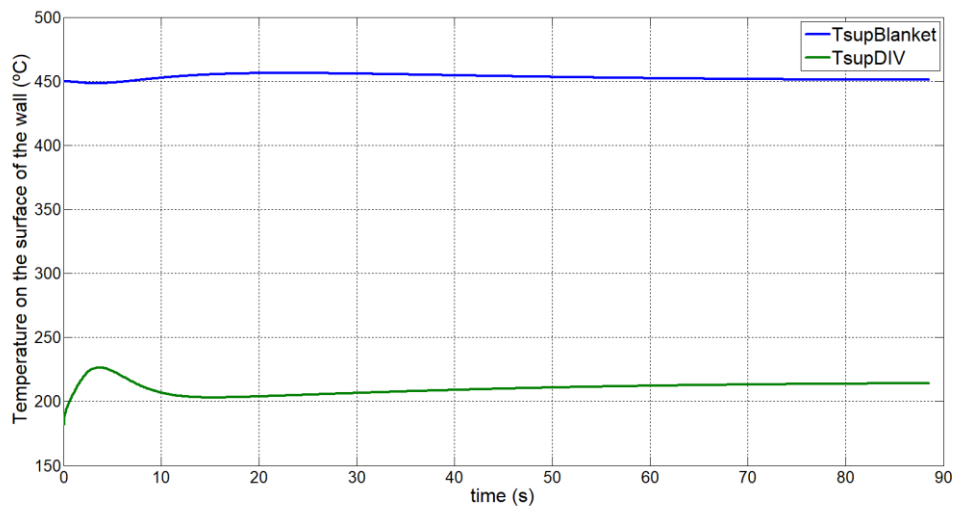


Figure 320: HCLL DEMO1 Auxiliary Heating sudden increase x6.4 Temperature on the surface of the blanket and divertor wall graphic.

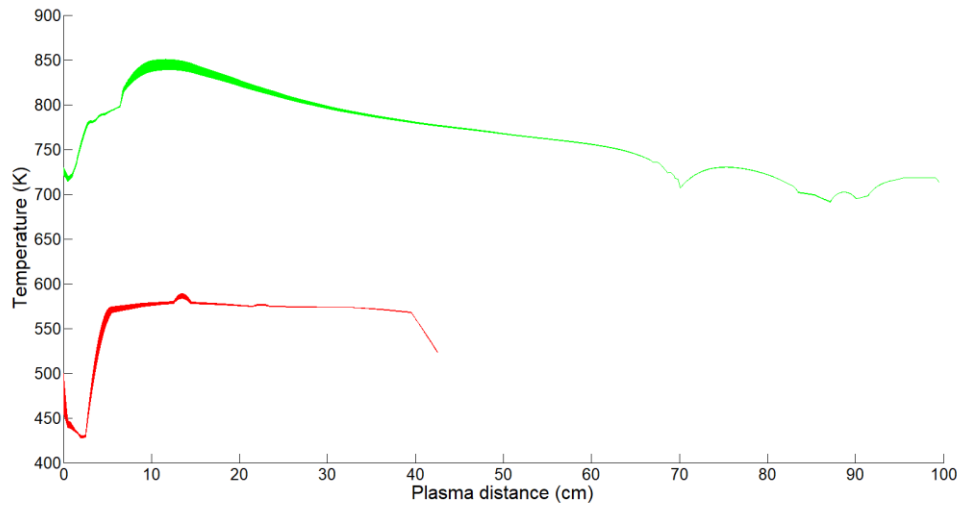


Figure 321: HCLL DEMO1 Auxiliary Heating sudden increase x6.4 evolution of the BB and divertor temperature graphic.

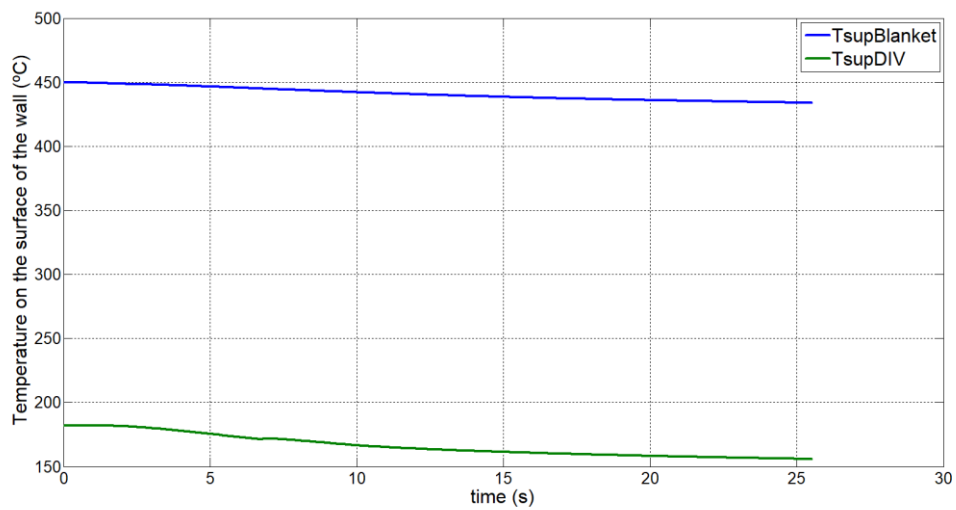


Figure 322: HCLL DEMO1 Fueling Rate Cut-off Temperature on the surface of the blanket and divertor wall graphic.

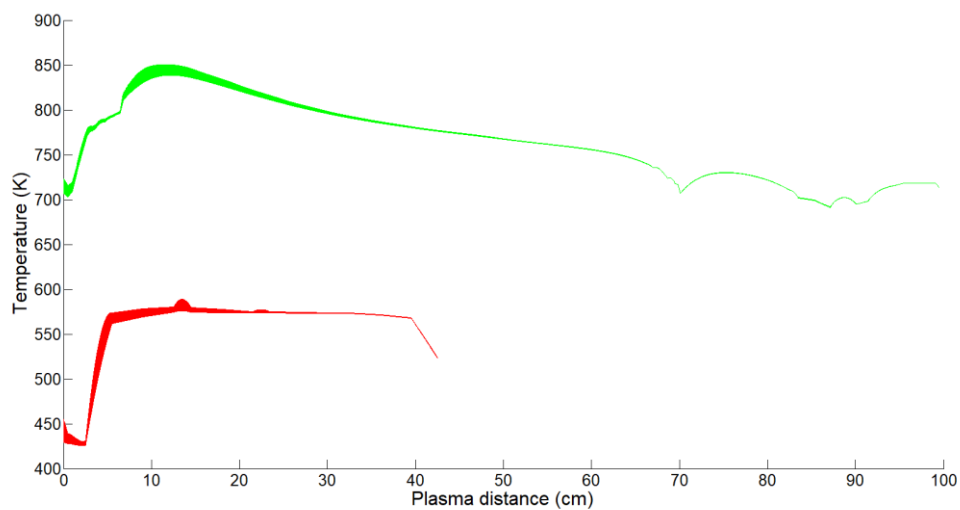


Figure 323: HCLL DEMO1 Fueling Rate Cut-off evolution of the BB and divertor temperature graphic.

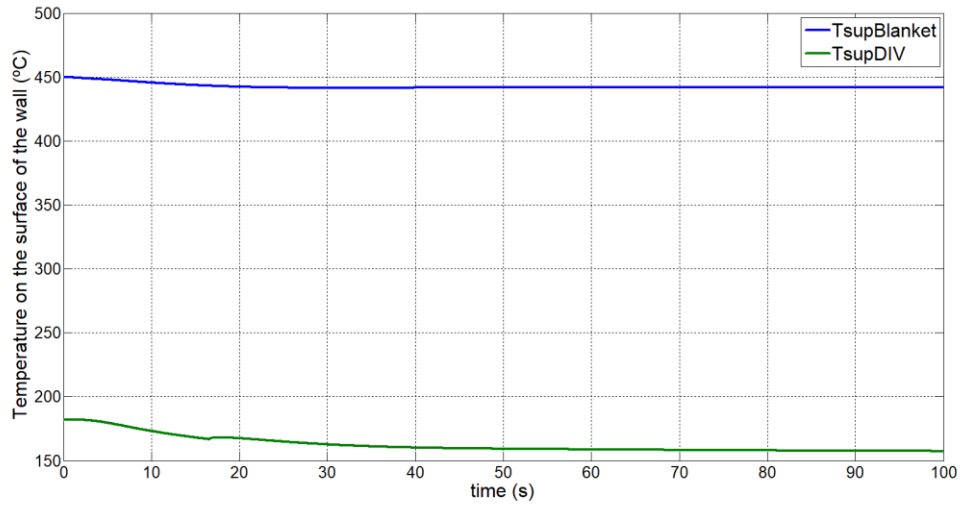


Figure 324: HCLL DEMO1 Fueling Rate sudden decrease x0.5 Temperature on the surface of the blanket and divertor wall graphic.

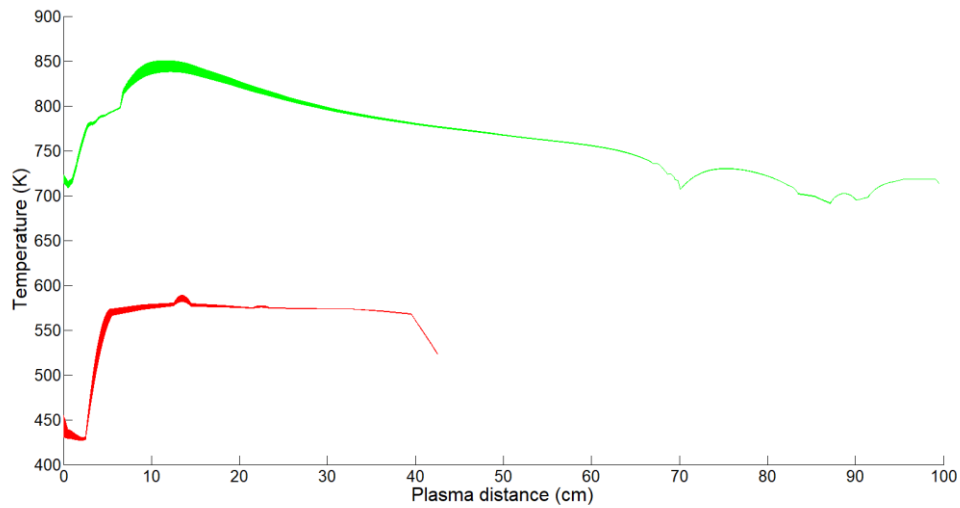


Figure 325: HCLL DEMO1 Fueling Rate sudden decrease x0.5 evolution of the BB and divertor temperature graphic.

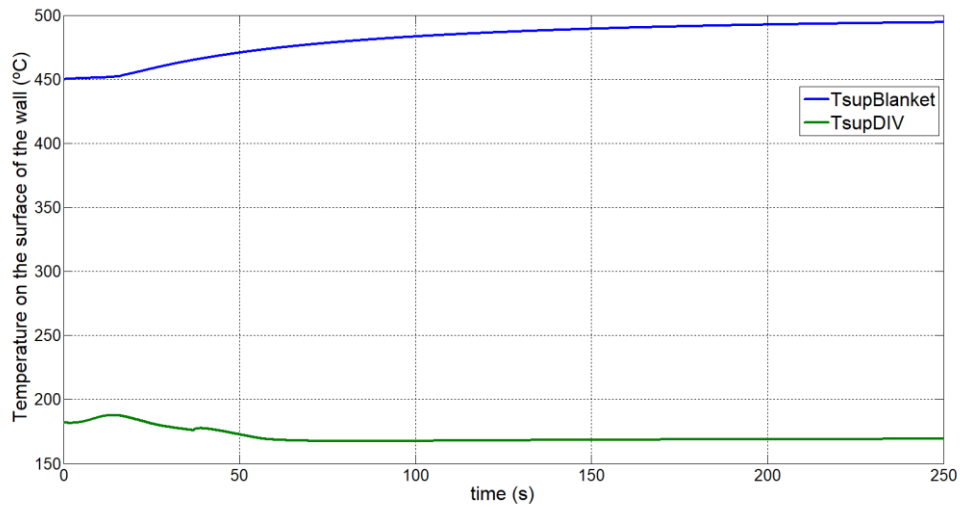


Figure 326: HCLL DEMO1 Fueling Rate sudden increase x1.25 Temperature on the surface of the blanket and divertor wall graphic.

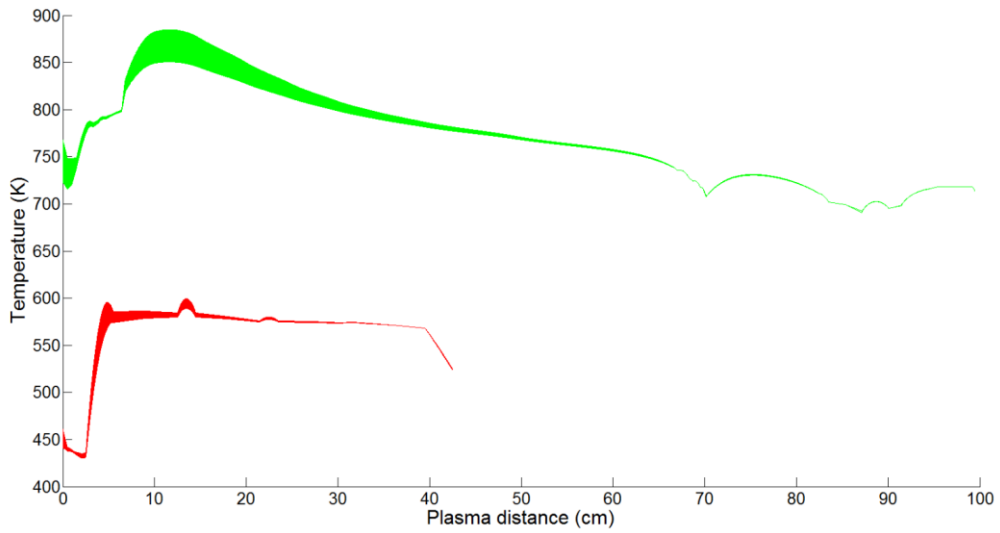


Figure 327: HCLL DEMO1 Fueling Rate sudden increase x1.25 evolution of the BB and divertor temperature graphic.

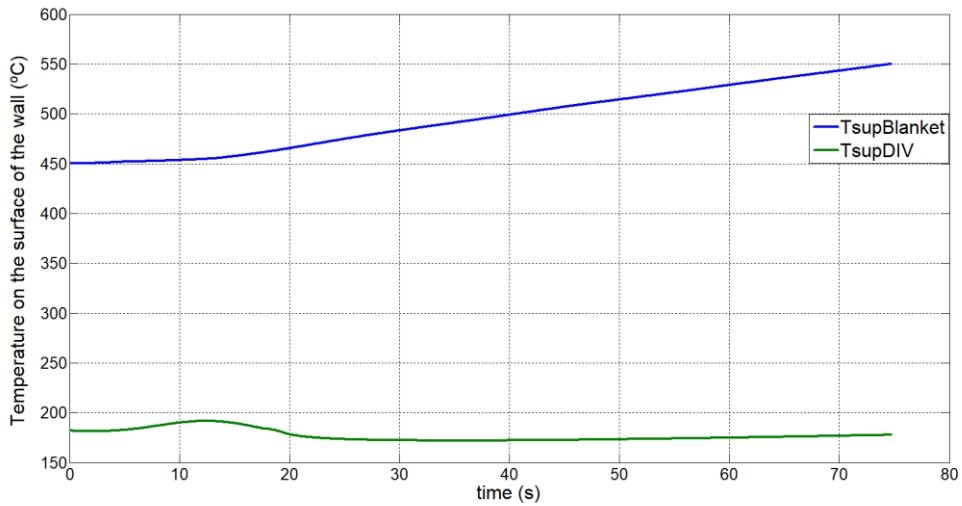


Figure 328: HCLL DEMO1 Fueling Rate sudden increase x1.5 Temperature on the surface of the blanket and divertor wall graphic.

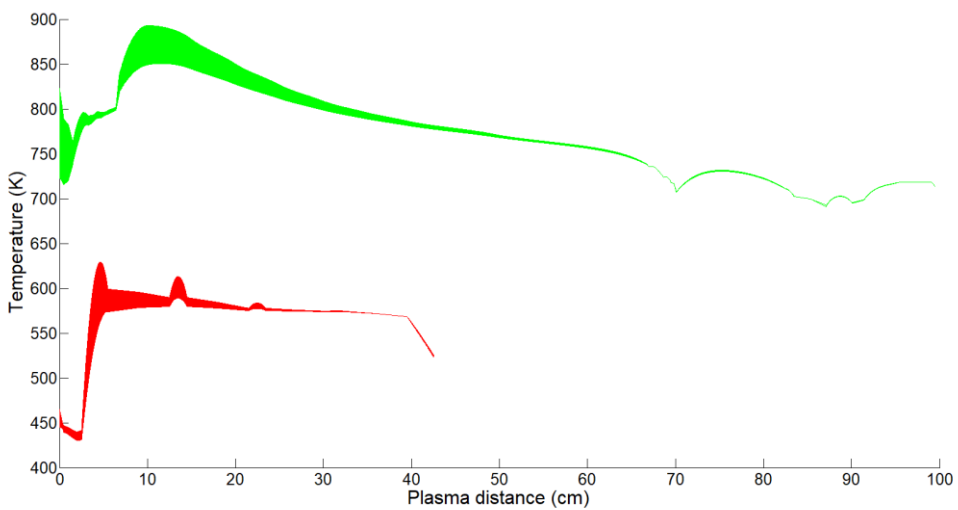


Figure 329: HCLL DEMO1 Fueling Rate sudden increase x1.5 evolution of the BB and divertor temperature graphic.

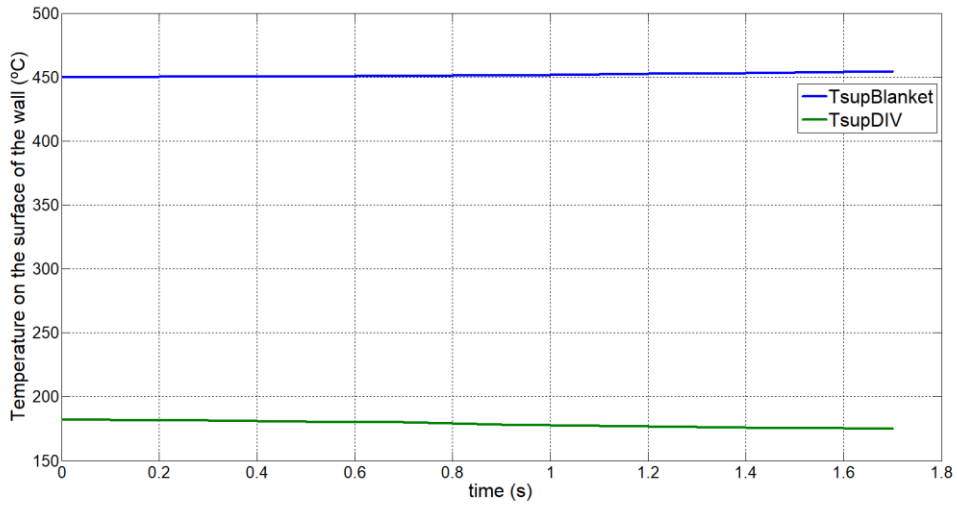


Figure 330: HCLL DEMO1 Fueling Rate sudden increase x6 Temperature on the surface of the blanket and divertor wall graphic.

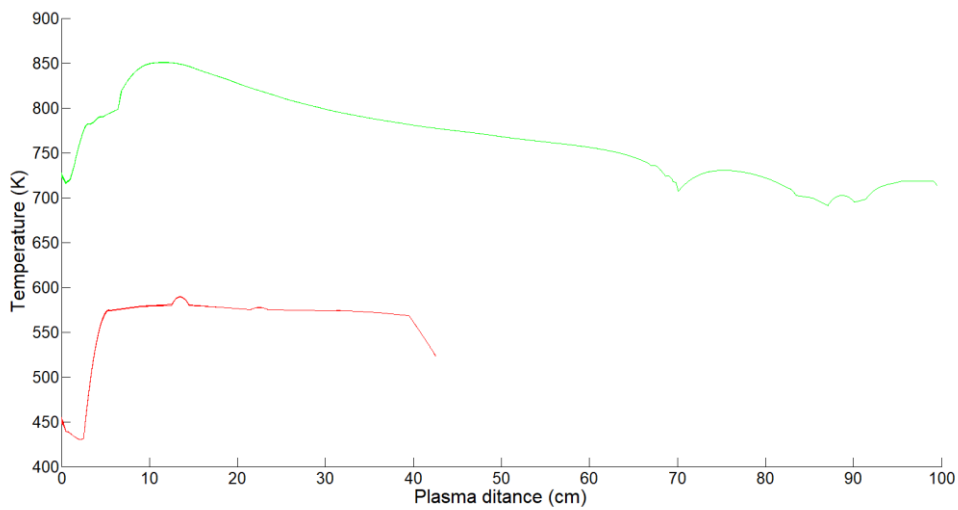


Figure 331: HCLL DEMO1 Fueling Rate sudden increase x6 evolution of the BB and divertor temperature graphic.

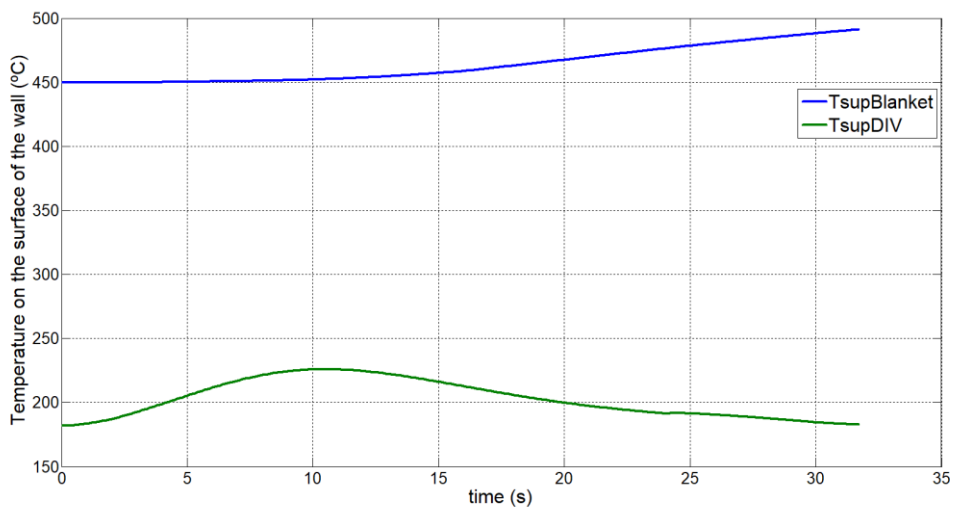


Figure 332: HCLL DEMO1 Confinement time improvement x1.5 Temperature on the surface of the blanket and divertor wall graphic.



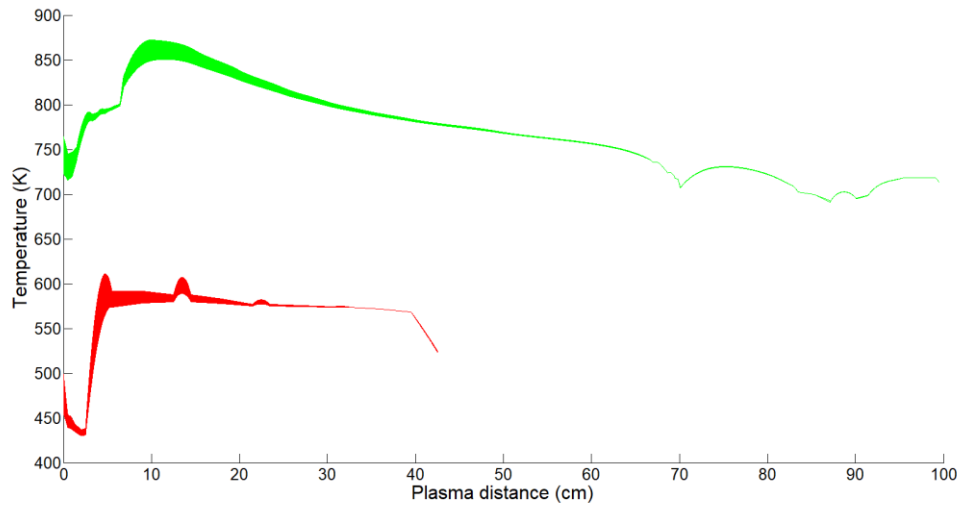


Figure 333: HCLL DEMO1 Confinement time improvement x1.5 evolution of the BB and divertor temperature graphic.

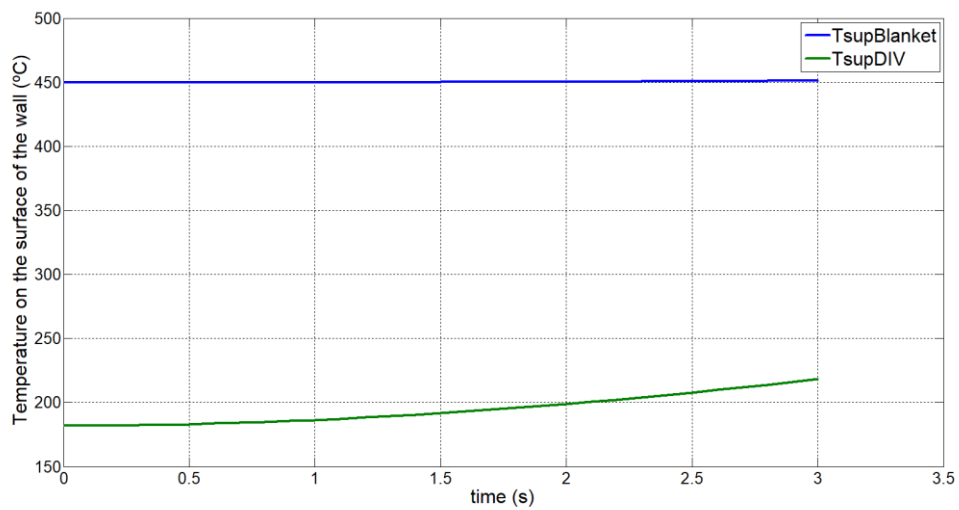


Figure 334: HCLL DEMO1 Confinement time improvement x5 Temperature on the surface of the blanket and divertor wall graphic.

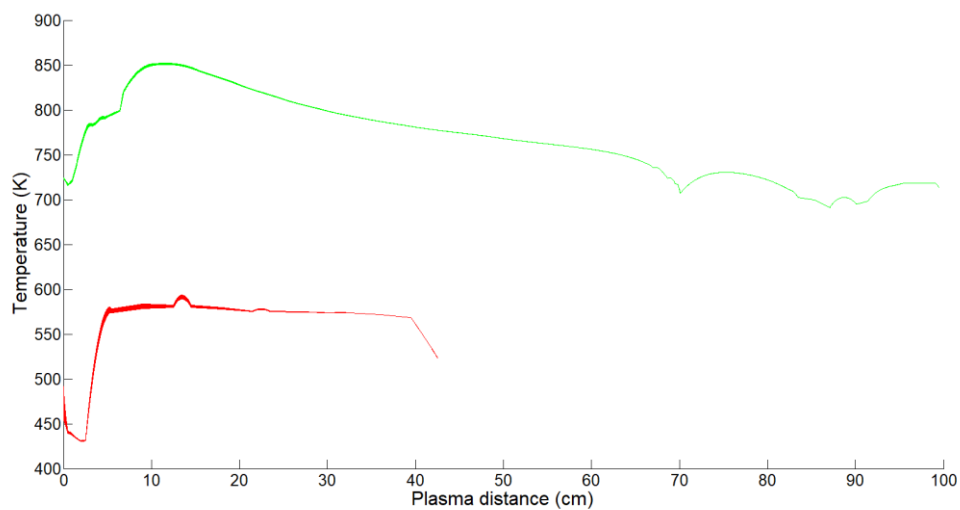


Figure 335: HCLL DEMO1 Confinement time improvement x5 evolution of the BB and divertor temperature graphic.

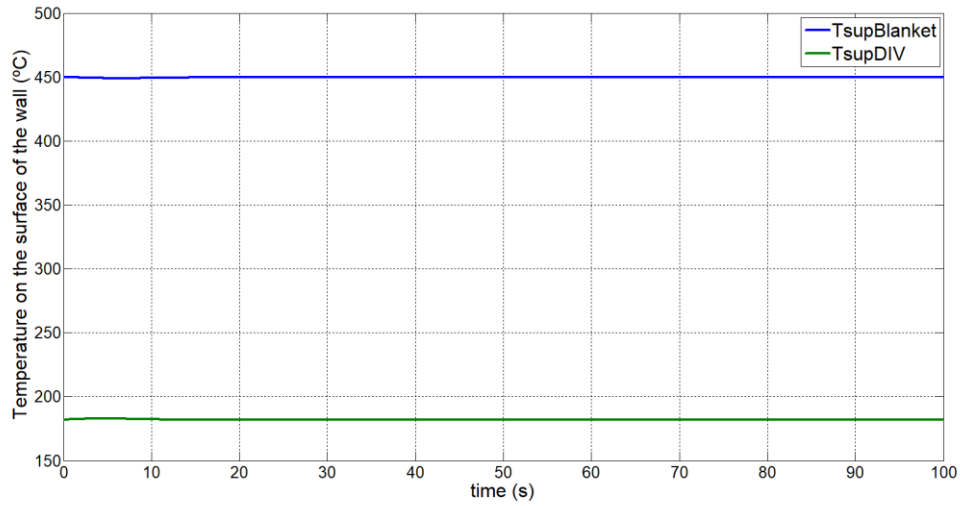


Figure 336: HCLL DEMO1 Occasional confinement time improvement x3 Temperature on the surface of the blanket and divertor wall graphic.

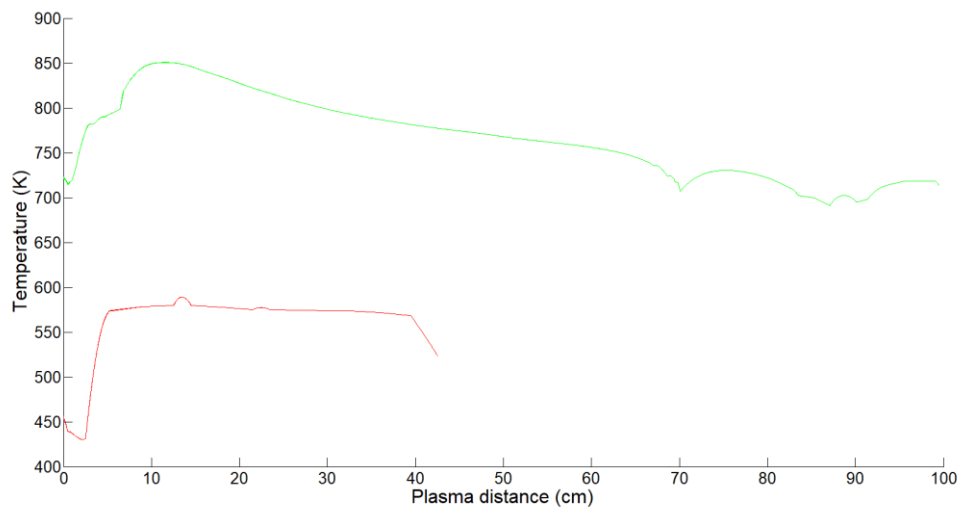


Figure 337: HCLL DEMO1 Occasional confinement time improvement x3 evolution of the BB and divertor temperature graphic.

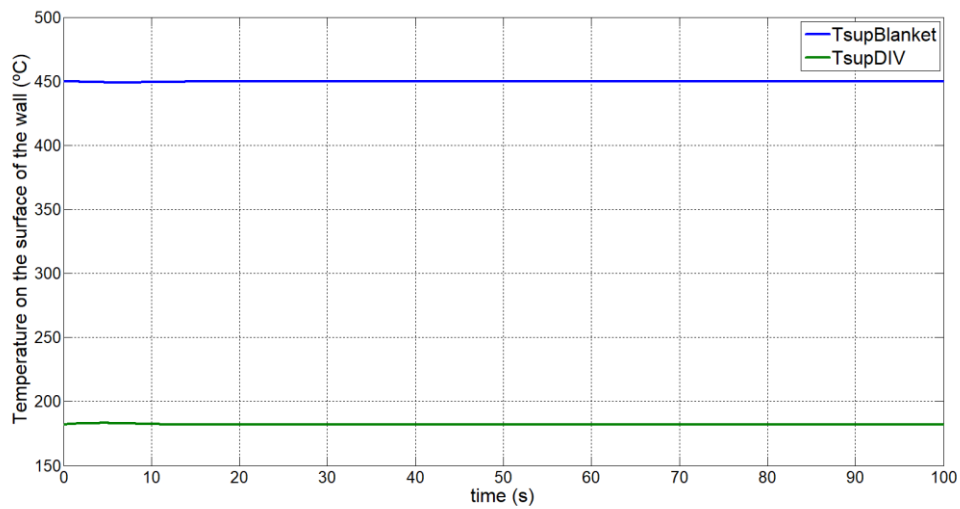


Figure 338: HCLL DEMO1 Occasional confinement time improvement x10 Temperature on the surface of the blanket and divertor wall graphic.

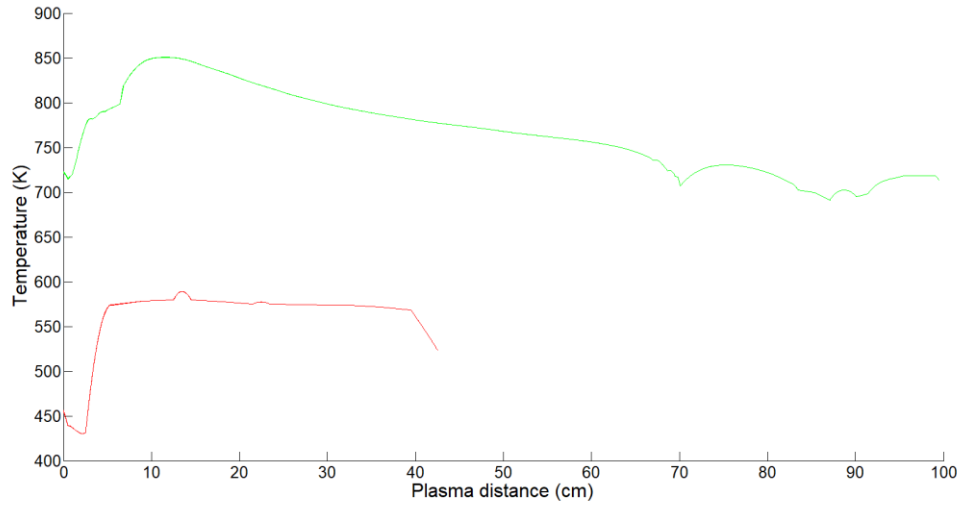


Figure 339: HCLL DEMO1 Occasional confinement time improvement x10 evolution of the BB and divertor temperature graphic.

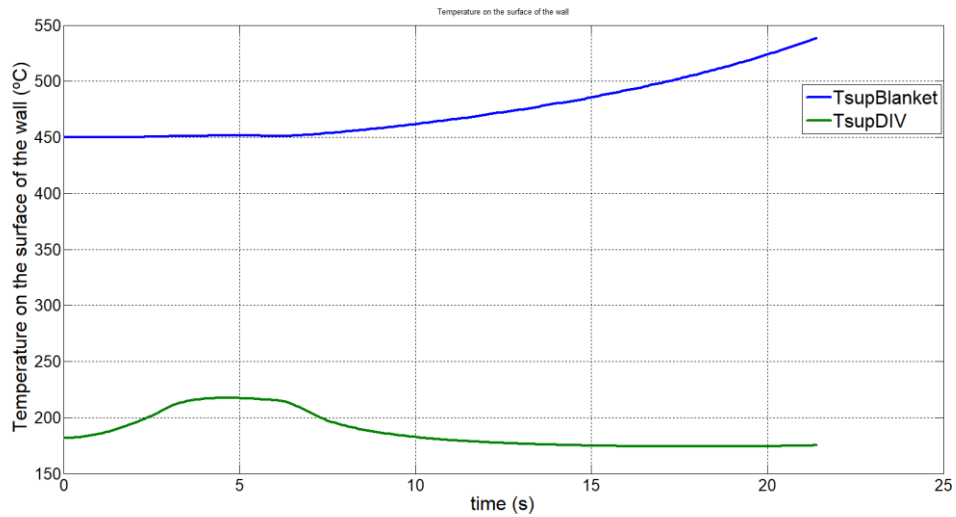


Figure 340: HCLL DEMO1 Occasional confinement time improvement x3 (during 3s) Temperature on the surface of the blanket and divertor wall graphic.

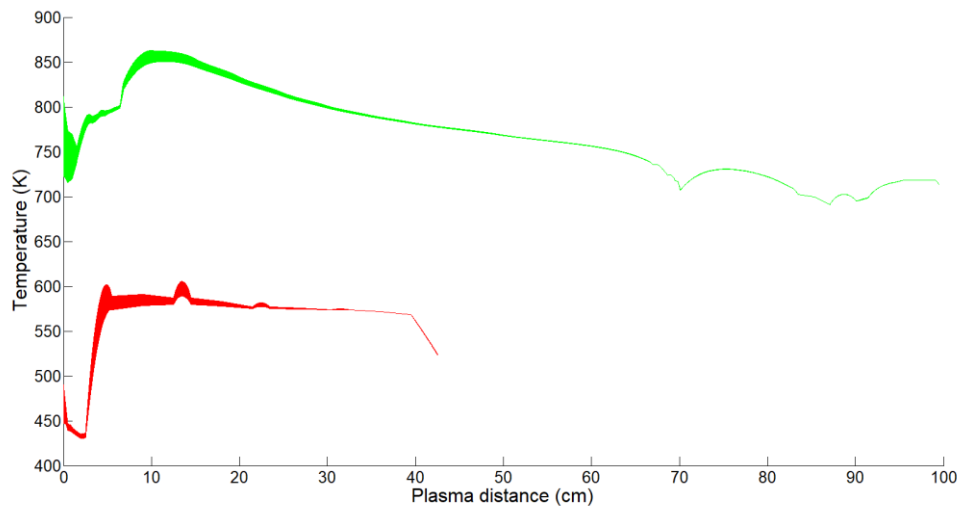


Figure 341: HCLL DEMO1 Occasional confinement time improvement x3 (during 3s) evolution of the BB and divertor temperature graphic.

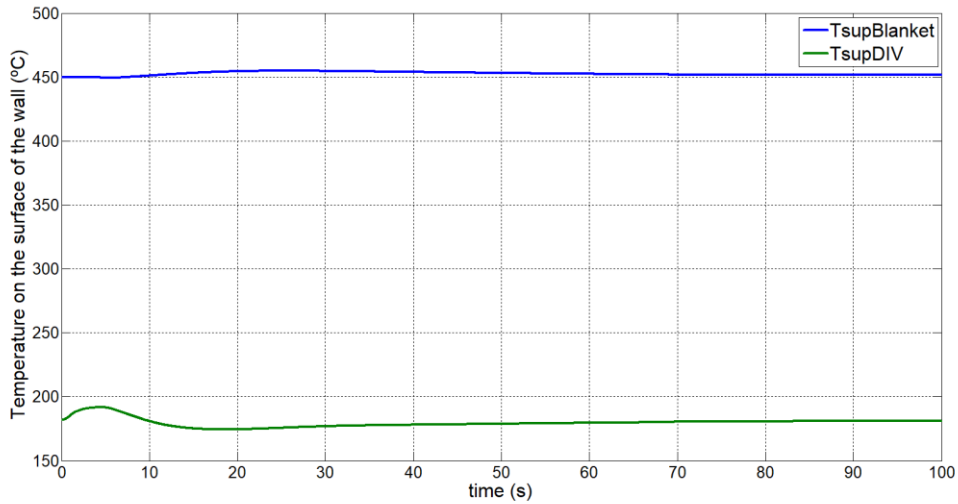


Figure 342: HCLL DEMO1 Occasional confinement time improvement x3 (during 1s) Temperature on the surface of the blanket and divertor wall graphic.

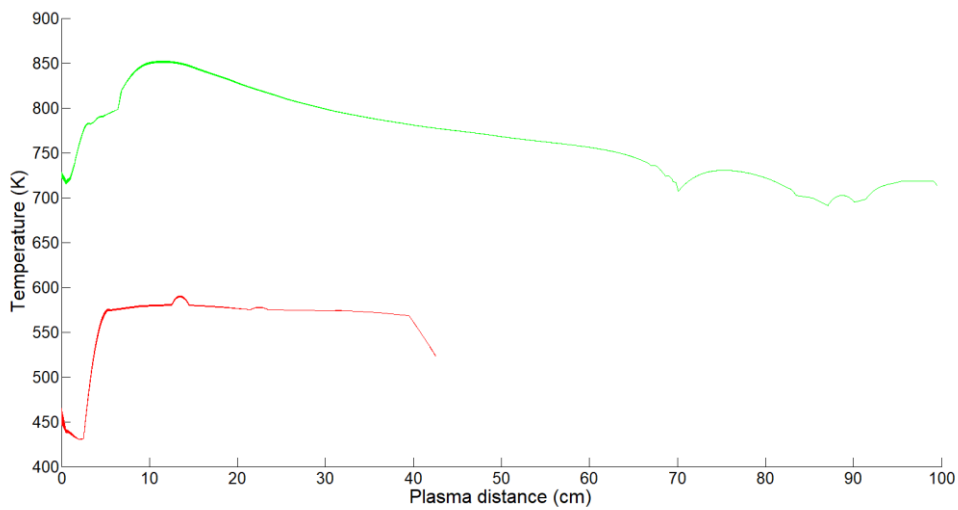


Figure 343: HCLL DEMO1 Occasional confinement time improvement x3 (during 1s) evolution of the BB and divertor temperature graphic.

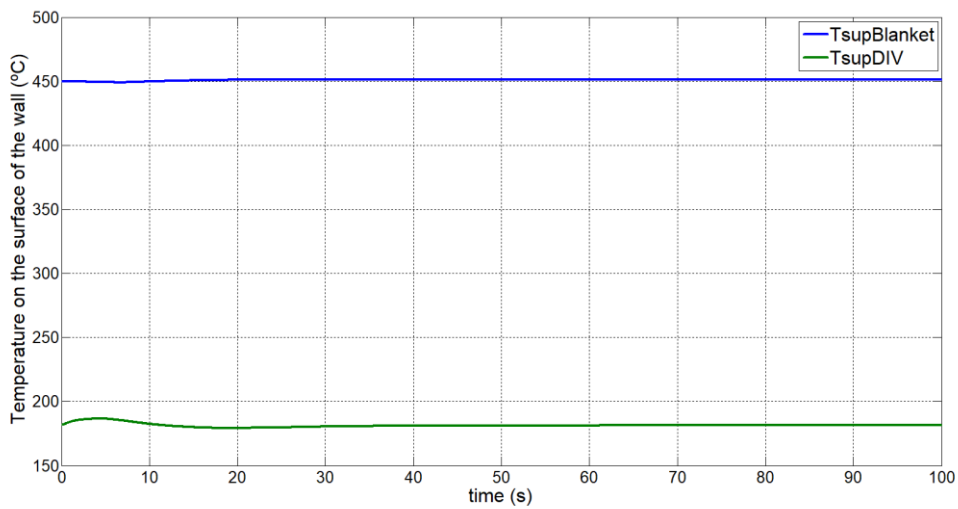


Figure 344: HCLL DEMO1 Occasional confinement time improvement x3 (during 0.5s) Temperature on the surface of the blanket and divertor wall graphic.

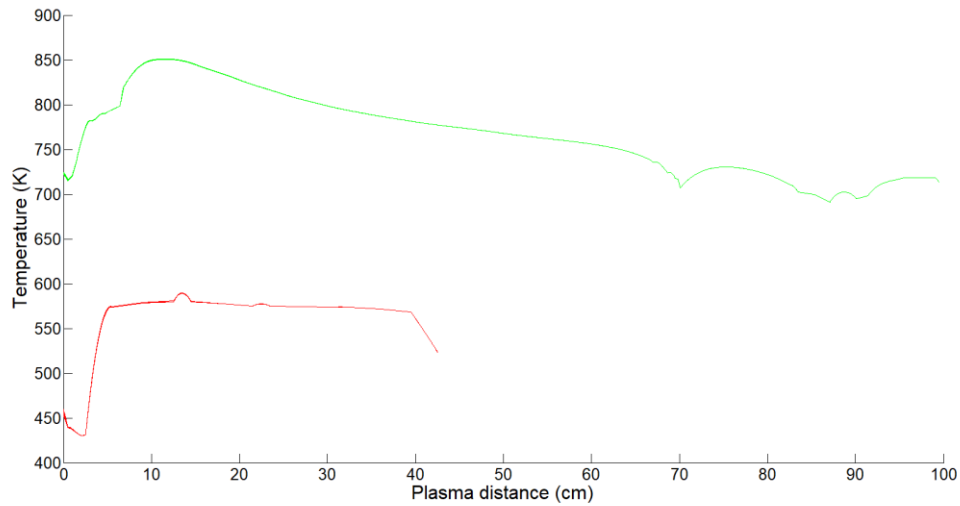


Figure 345: HCLL DEMO1 Occasional confinement time improvement x3 (during 0.5s) evolution of the BB and divertor temperature graphic.

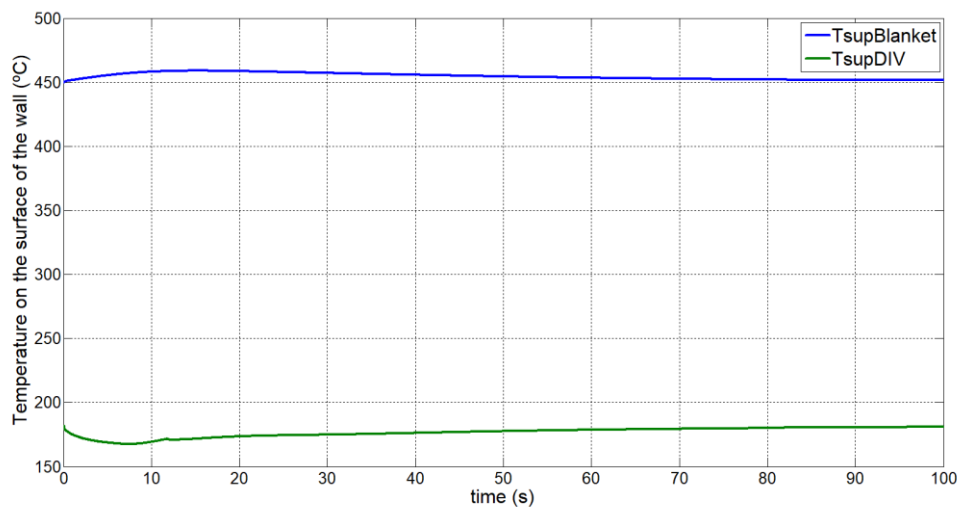


Figure 346: HCLL DEMO1 Punctual impurities entrance x1.5 Temperature on the surface of the blanket and divertor wall graphic.

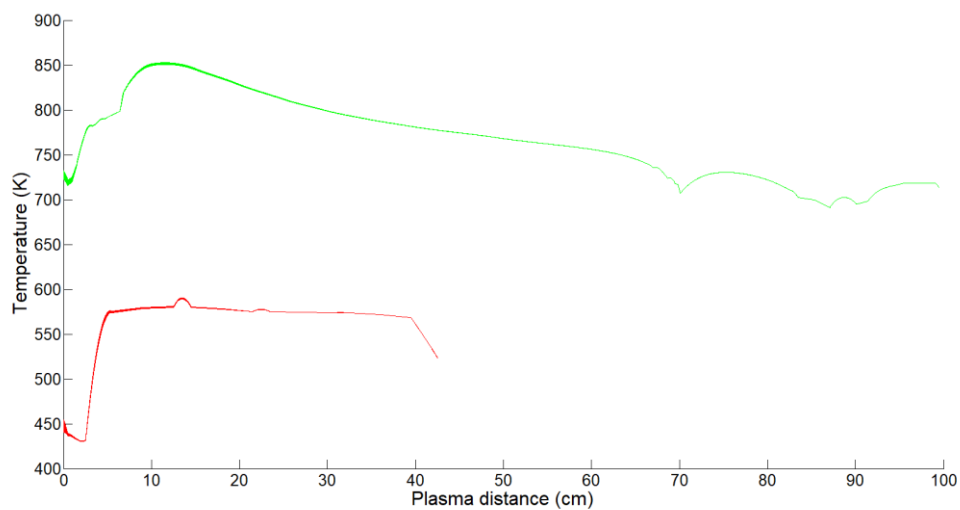


Figure 347: HCLL DEMO1 Punctual impurities entrance x1.5 evolution of the BB and divertor temperature graphic.

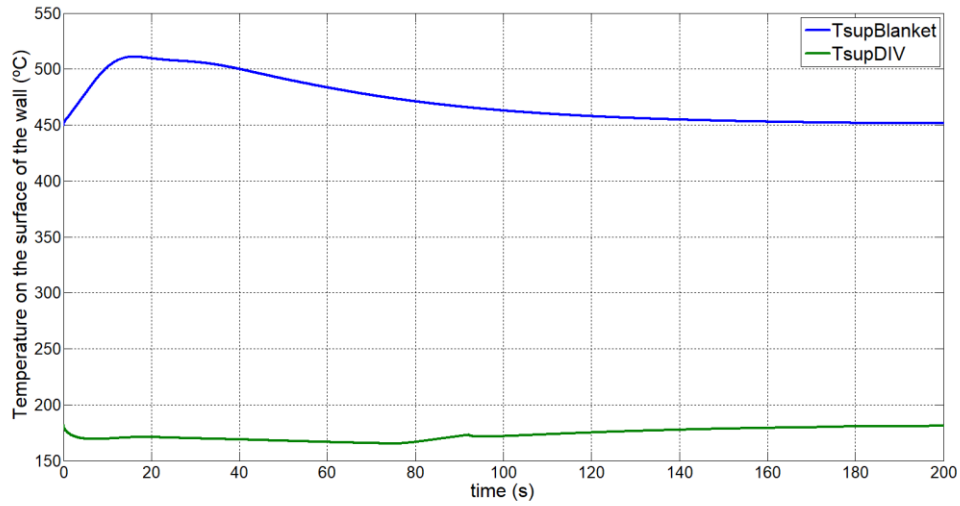


Figure 348: HCLL DEMO1 Punctual impurities entrance x2.9 Temperature on the surface of the blanket and divertor wall graphic.

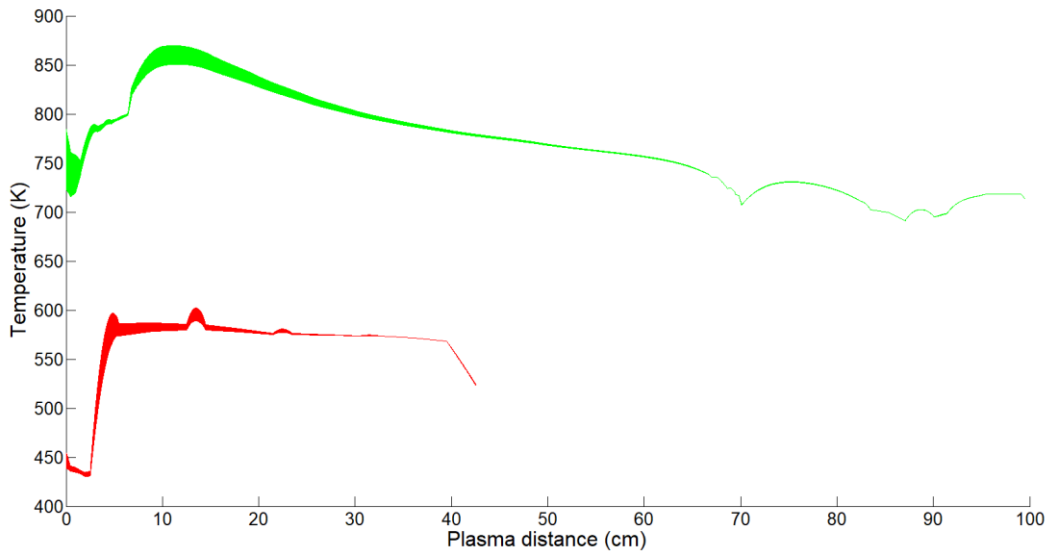


Figure 349: HCLL DEMO1 Punctual impurities entrance x2.9 evolution of the BB and divertor temperature graphic.

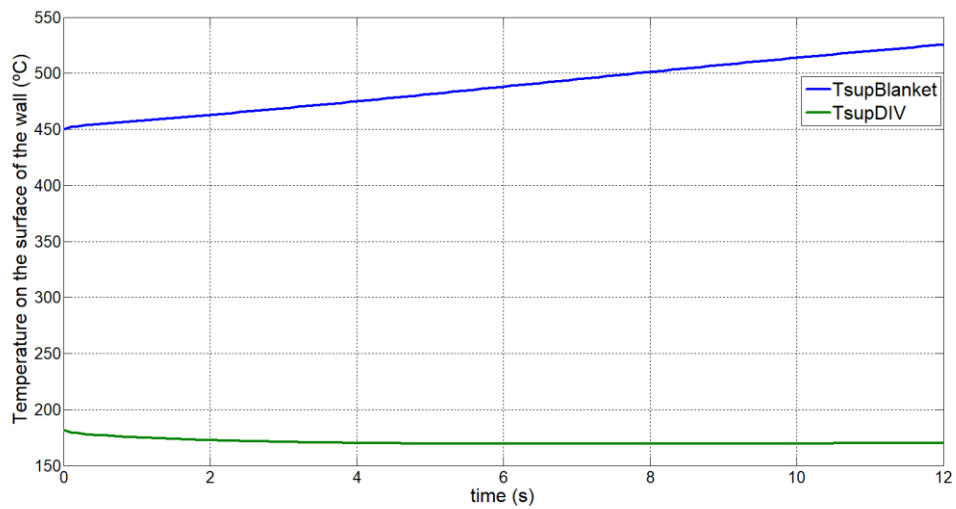


Figure 350: HCLL DEMO1 Punctual impurities entrance x3 Temperature on the surface of the blanket and divertor wall graphic.

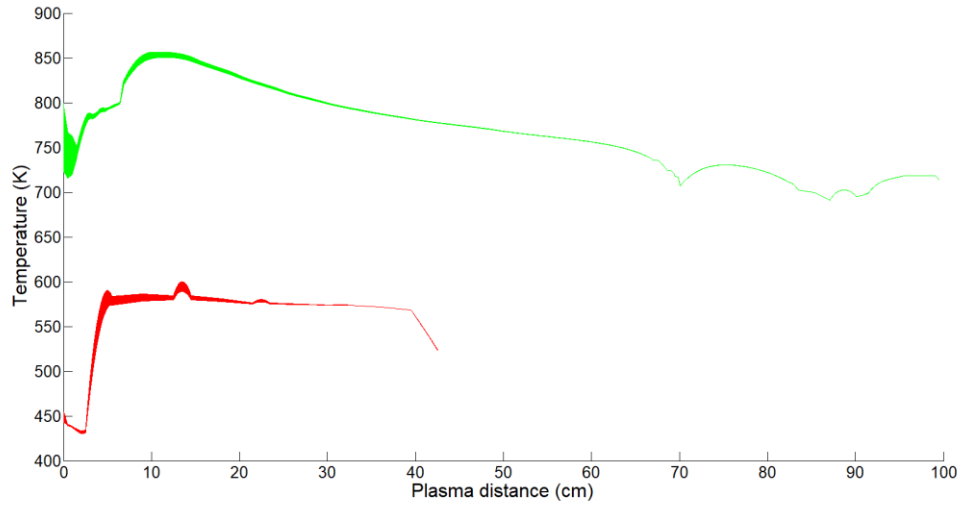


Figure 351: HCLL DEMO1 Punctual impurities entrance x3 evolution of the BB and divertor temperature graphic.

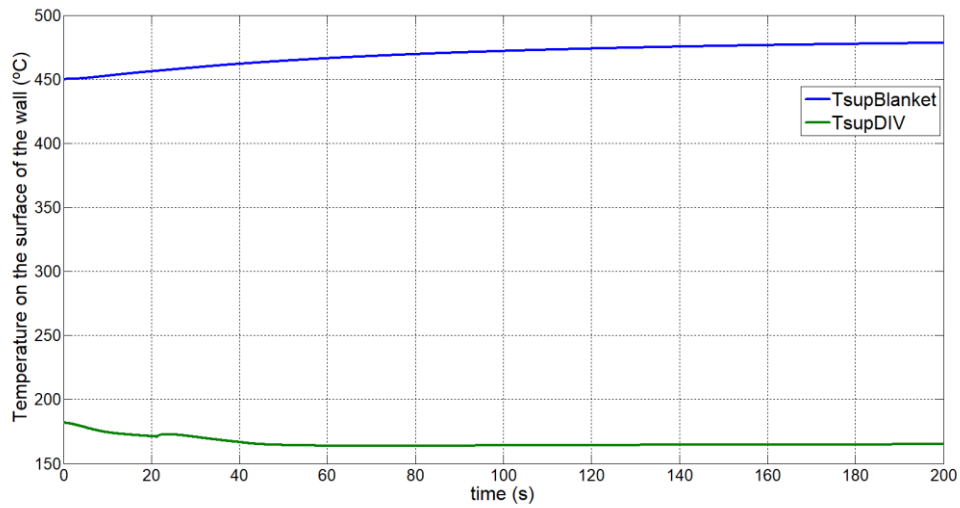


Figure 352: HCLL DEMO1 Tungsten permanent entrance x4 Temperature on the surface of the blanket and divertor wall graphic.

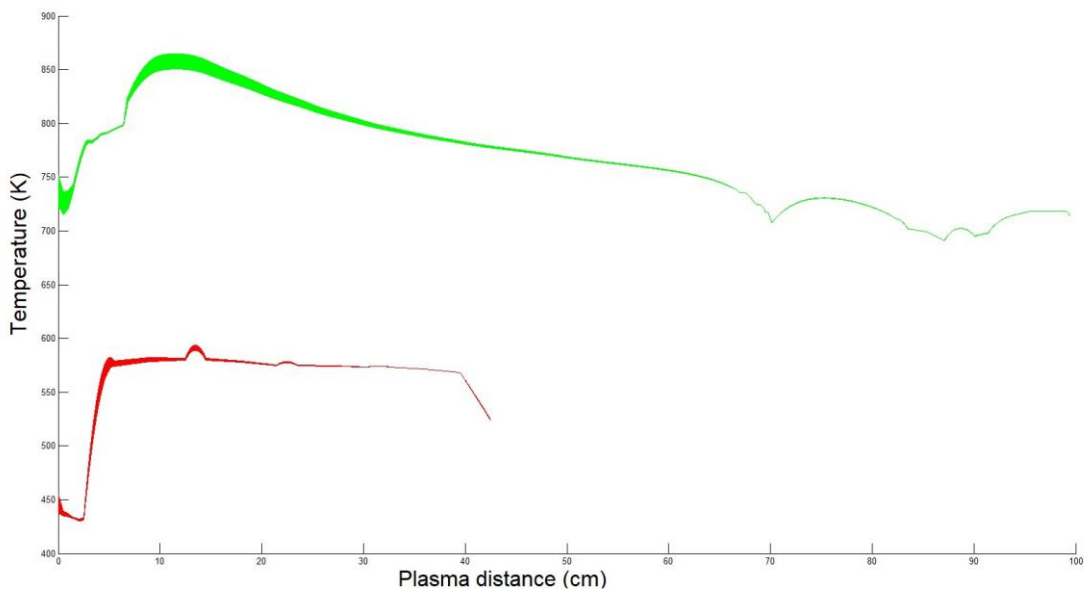


Figure 353: HCLL DEMO1 Tungsten permanent entrance x4 evolution of the BB and divertor temperature graphic.

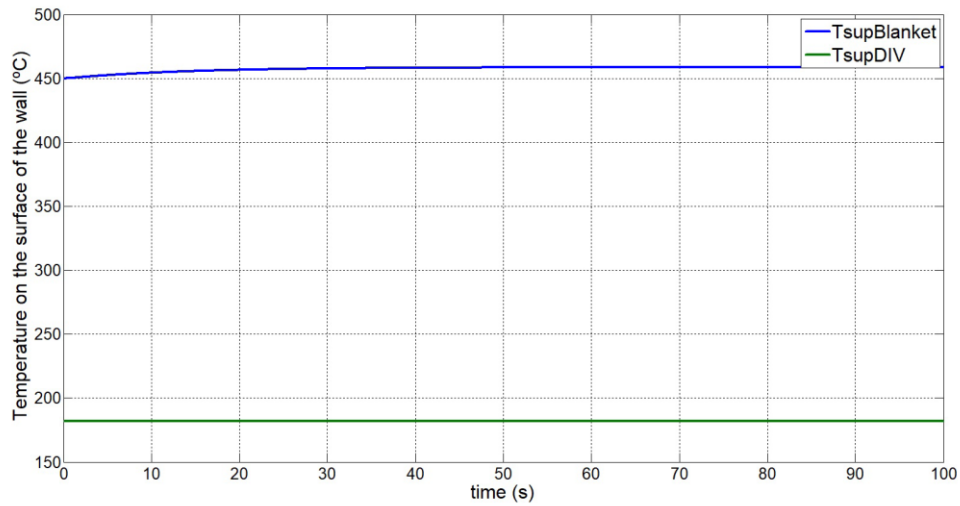


Figure 354: HCLL DEMO1 BB LOCA 30% in all the cooling loops (FW and internal channels). Temperature on the surface of the blanket and divertor wall graphic.

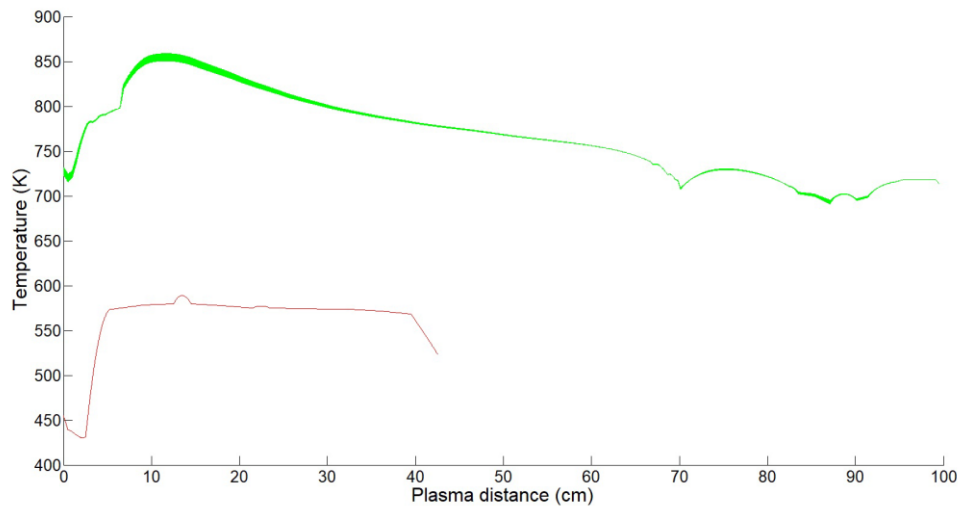


Figure 355: HCLL DEMO1 BB LOCA 30% in all the cooling loops (FW and internal channels). Evolution of the BB and divertor temperature graphic.

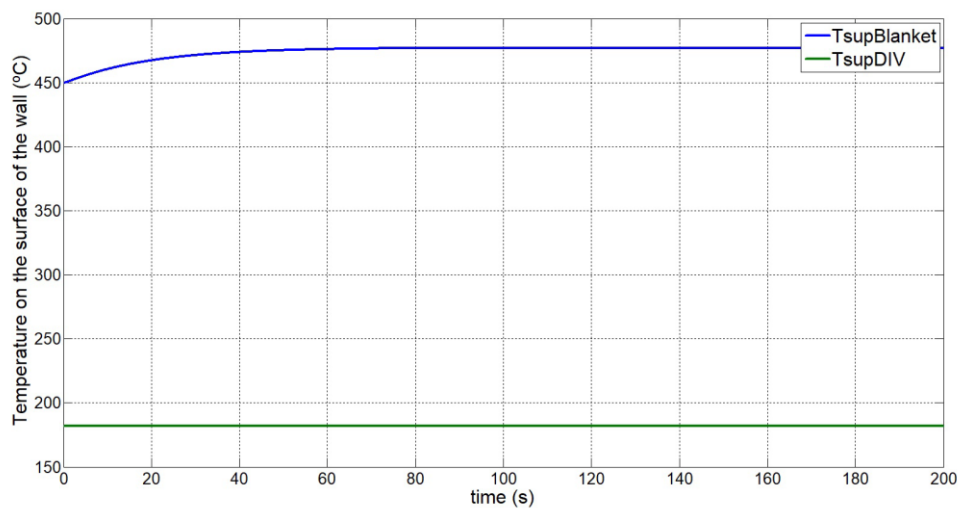


Figure 356: HCLL DEMO1 BB LOCA 60% in all the cooling loops (FW and internal channels). Temperature on the surface of the blanket and divertor wall graphic.



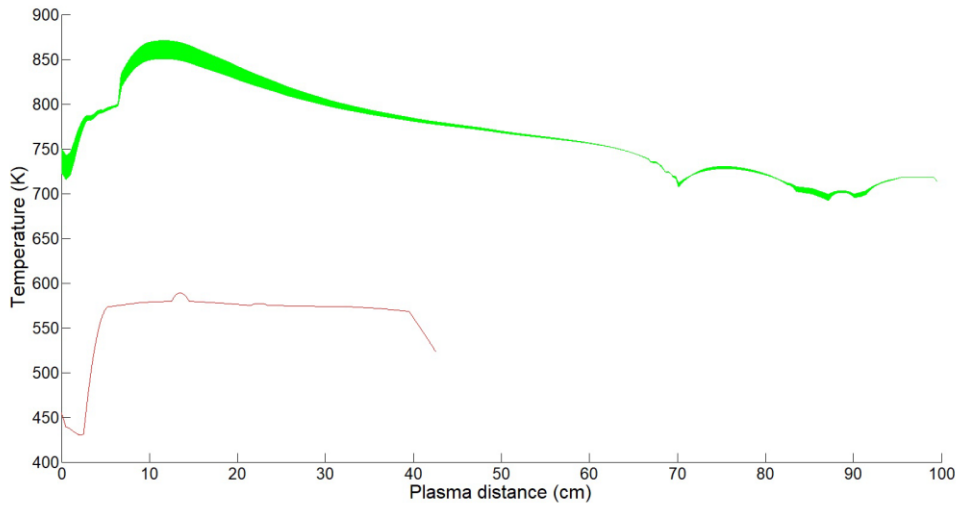


Figure 357: HCLL DEMO1 BB LOCA 60% in all the cooling loops (FW and internal channels). Evolution of the BB and divertor temperature graphic.

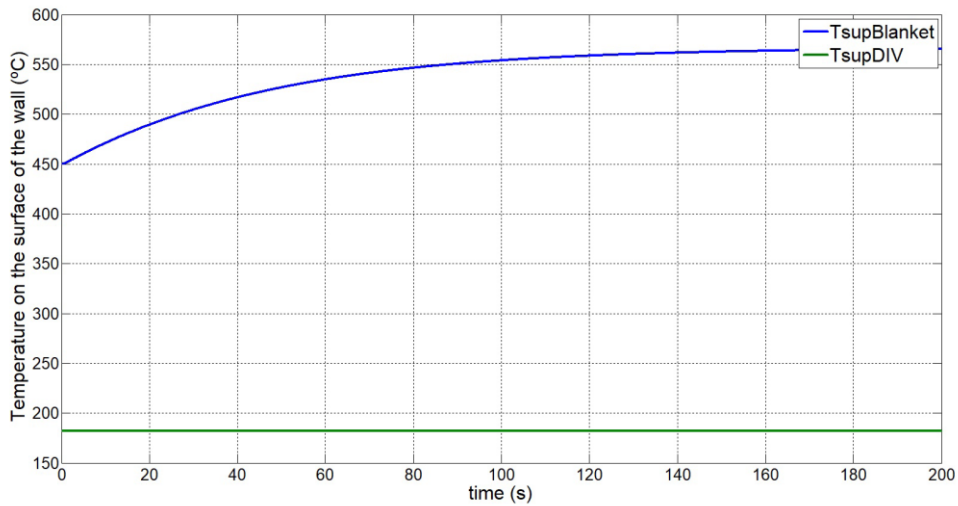


Figure 358: HCLL DEMO1 BB LOCA 90% in all the cooling loops (FW and internal channels). Temperature on the surface of the blanket and divertor wall graphic.

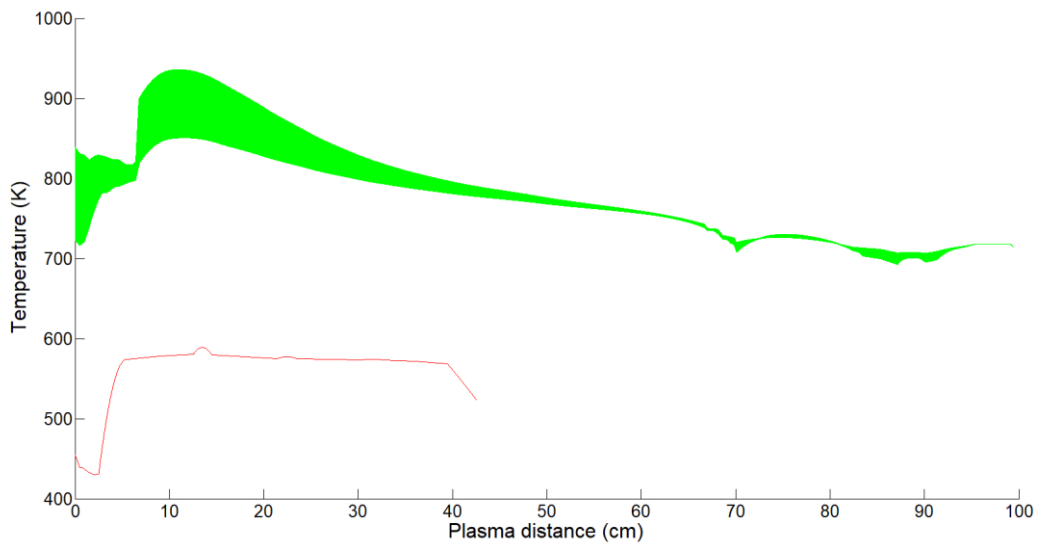


Figure 359: HCLL DEMO1 BB LOCA 90% in all the cooling loops (FW and internal channels). Evolution of the BB and divertor temperature graphic.

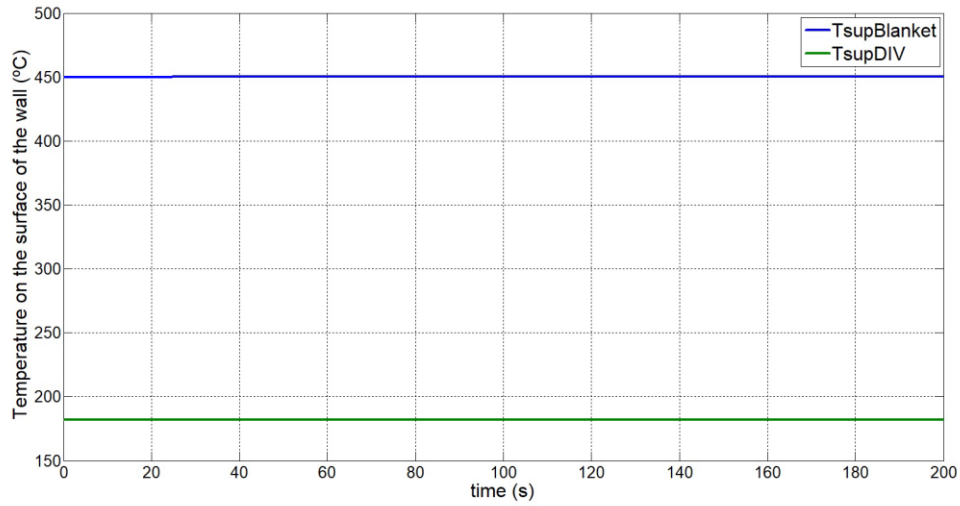


Figure 360: HCLL DEMO1 BB LOCA 90% in the internal channels. Temperature on the surface of the blanket and divertor wall graphic.

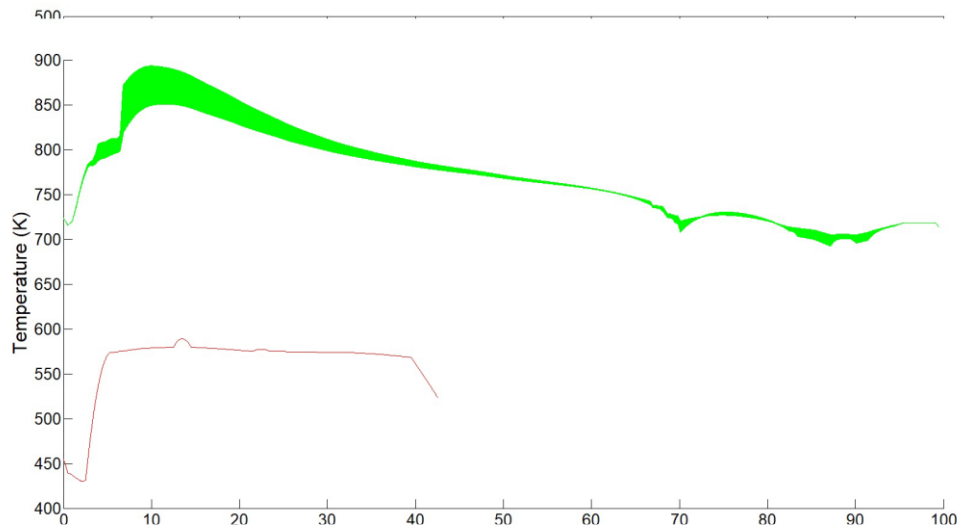


Figure 361: HCLL DEMO1 BB LOCA 90% in the internal channels. Evolution of the BB and divertor temperature graphic.

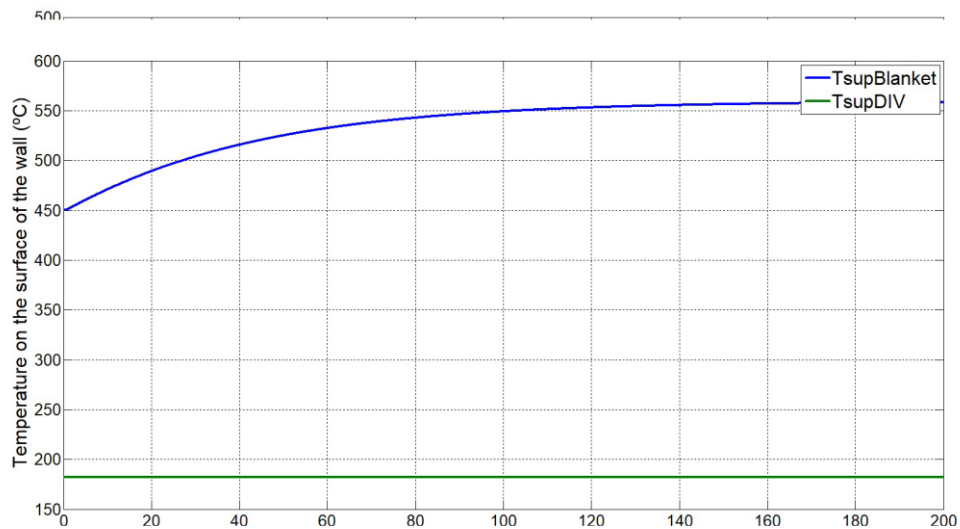


Figure 362: HCLL DEMO1 BB LOCA 90% in the FW cooling loop. Temperature on the surface of the blanket and divertor wall graphic.

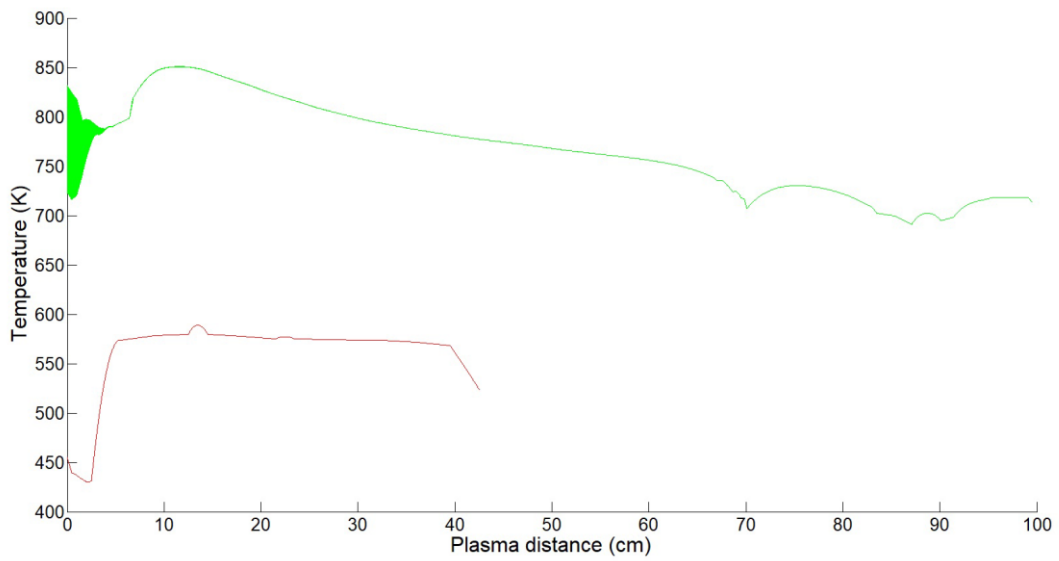


Figure 363: HCLL DEMO1 BB LOCA 90% in the FW cooling loop. Evolution of the BB and divertor temperature graphic.

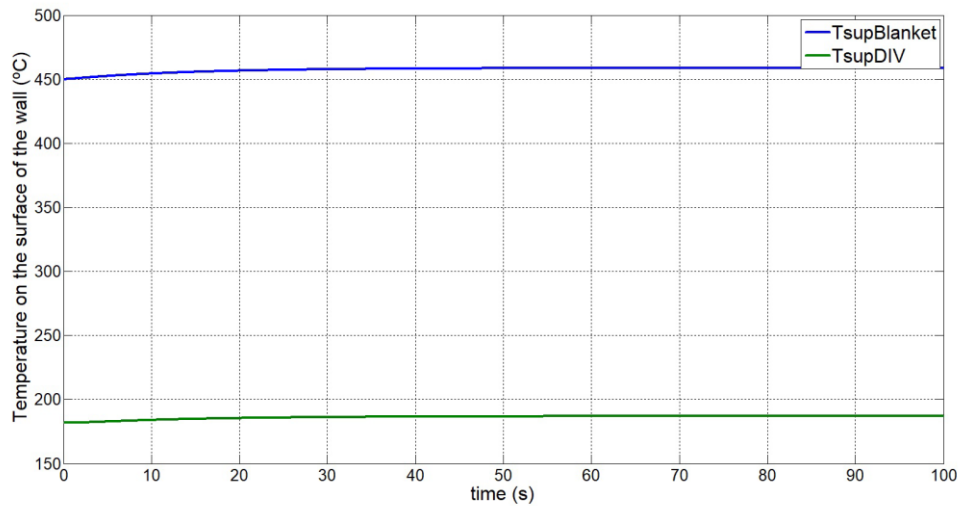


Figure 364: HCLL DEMO1 Divertor and BB LOCA 30% in all the cooling loops. Temperature on the surface of the blanket and divertor wall graphic.

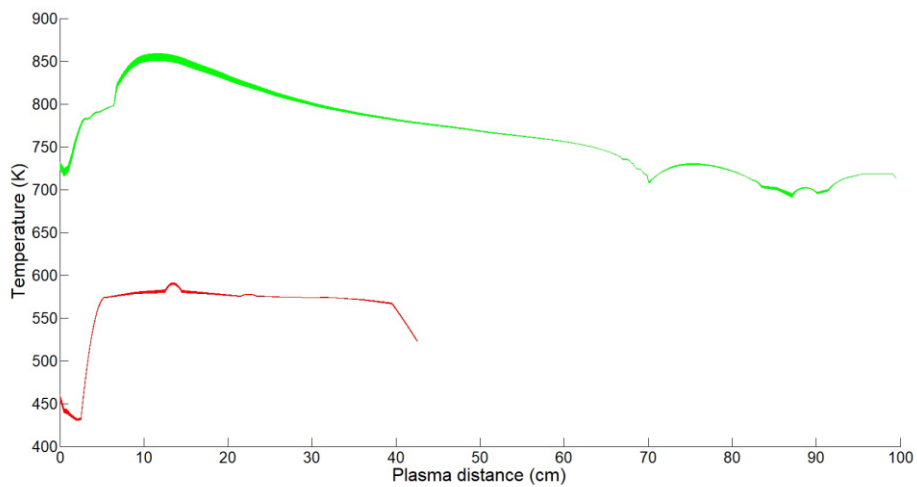


Figure 365: HCLL DEMO1 Divertor and BB LOCA 30% in all the cooling loops. Evolution of the BB and divertor temperature graphic.

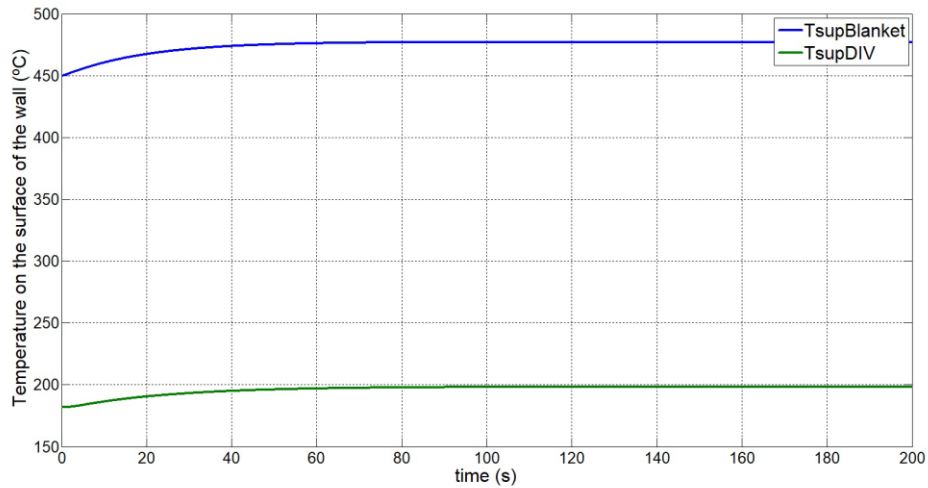


Figure 366: HCLL DEMO1 Divertor and BB LOCA 60% in all the cooling loops. Temperature on the surface of the blanket and divertor wall graphic.

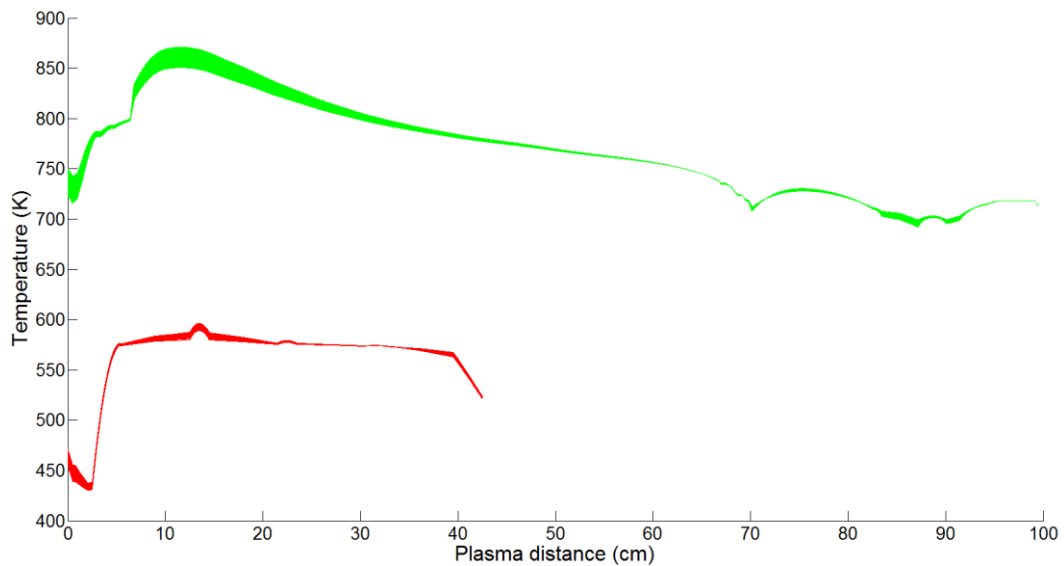


Figure 367: HCLL DEMO1 Divertor and BB LOCA 60% in all the cooling loops. Evolution of the BB and divertor temperature graphic.

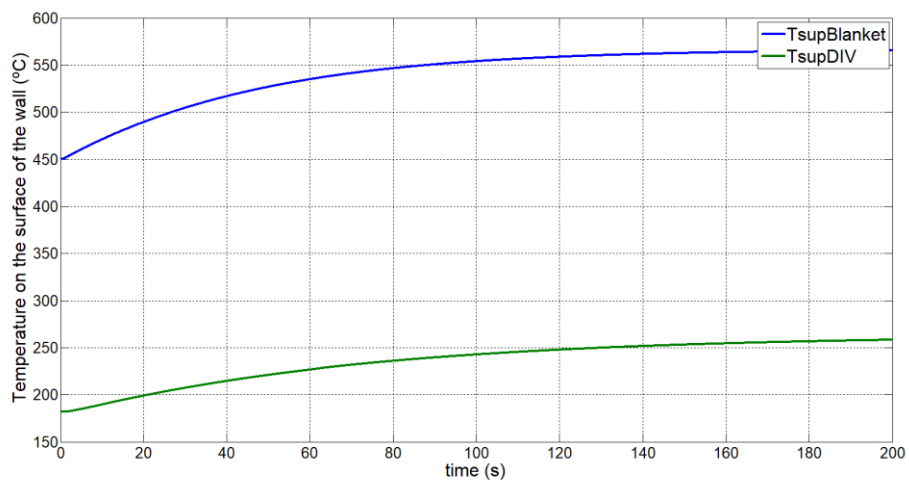


Figure 368: HCLL DEMO1 Divertor and BB LOCA 90% in all the cooling loops. Temperature on the surface of the blanket and divertor wall graphic.

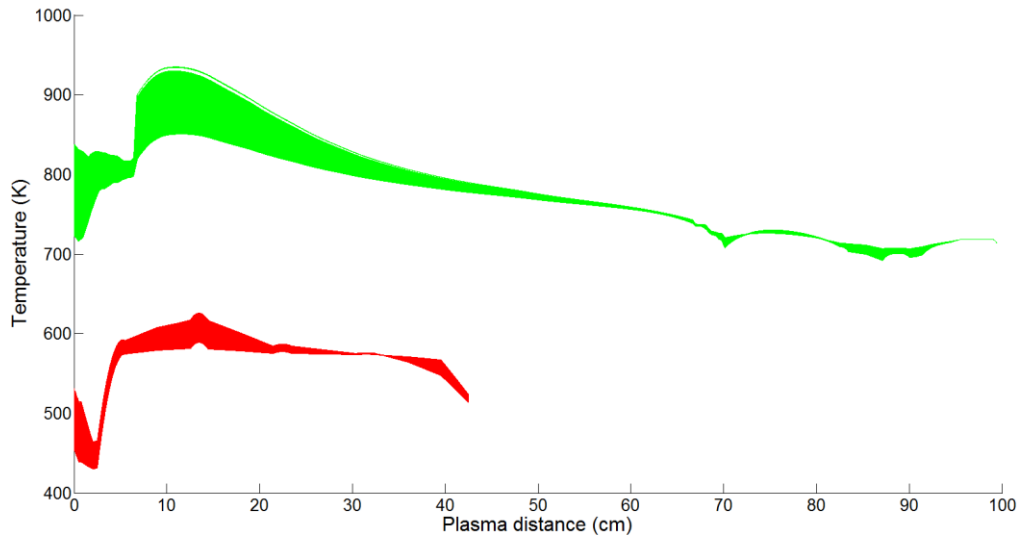


Figure 369: HCLL DEMO1 Divertor and BB LOCA 90% in all the cooling loops. Evolution of the BB and divertor temperature graphic.

## ANNEX D: WCLL graphics

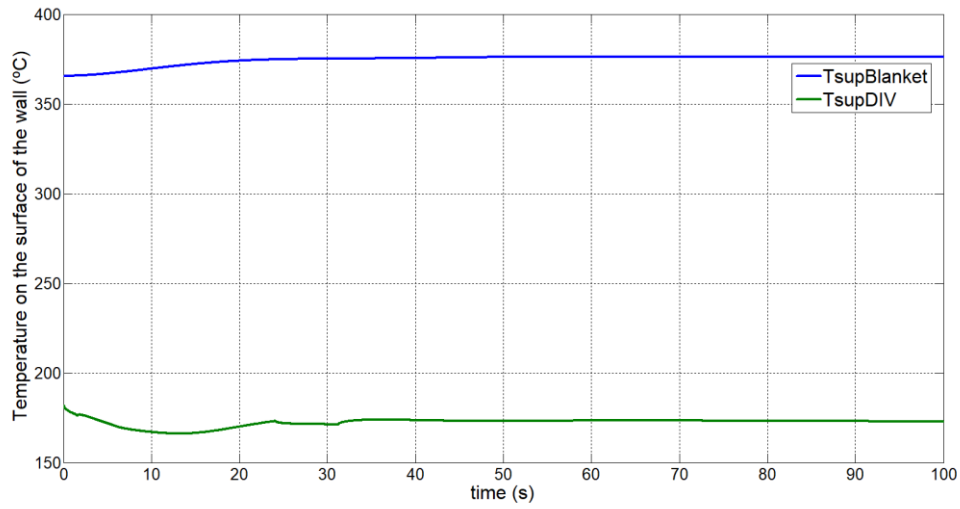


Figure 370: WCLL DEMO1 Auxiliary Heating Cut-off T on the surface of the blanket and divertor wall graphic.

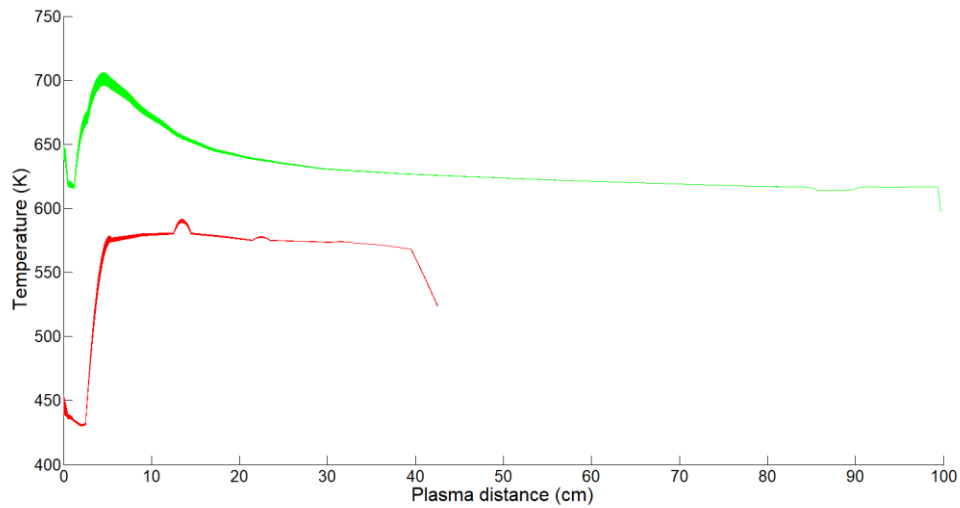


Figure 371: WCLL DEMO1 Auxiliary Heating Cut-off evolution of the BB and divertor temperature graphic.

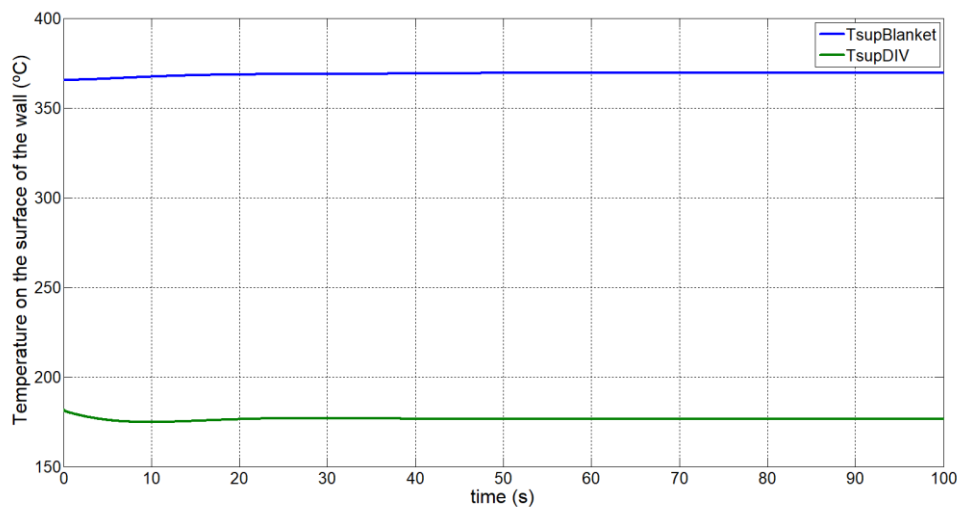


Figure 372: WCLL DEMO1 Auxiliary Heating sudden decrease x0.5 Temperature on the surface of the blanket and divertor wall graphic.

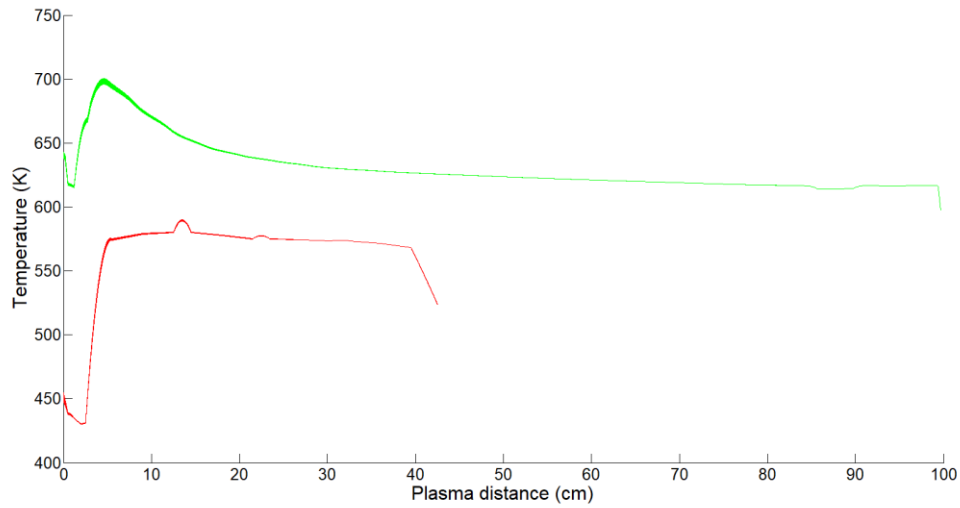


Figure 373: WCLL DEMO1 Auxiliary Heating sudden decrease x0.5 evolution of the BB and divertor temperature graphic.

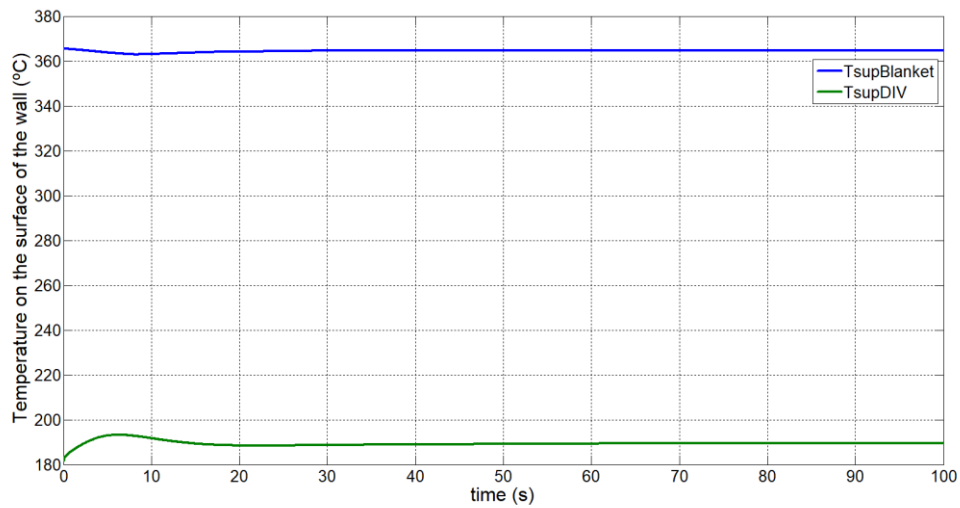


Figure 374: WCLL DEMO1 Auxiliary Heating sudden increase x2 Temperature on the surface of the blanket and divertor wall graphic.

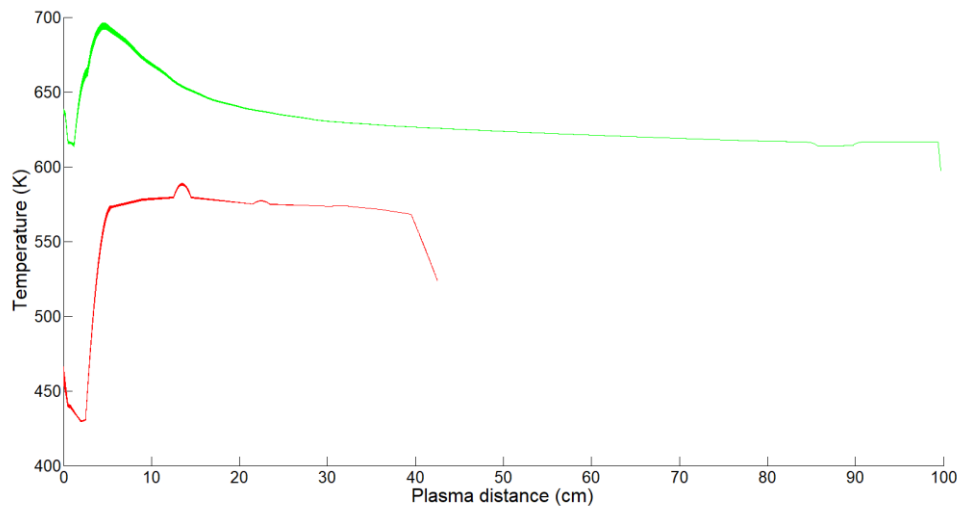


Figure 375: WCLL DEMO1 Auxiliary Heating sudden increase x2 evolution of the BB and divertor temperature graphic.

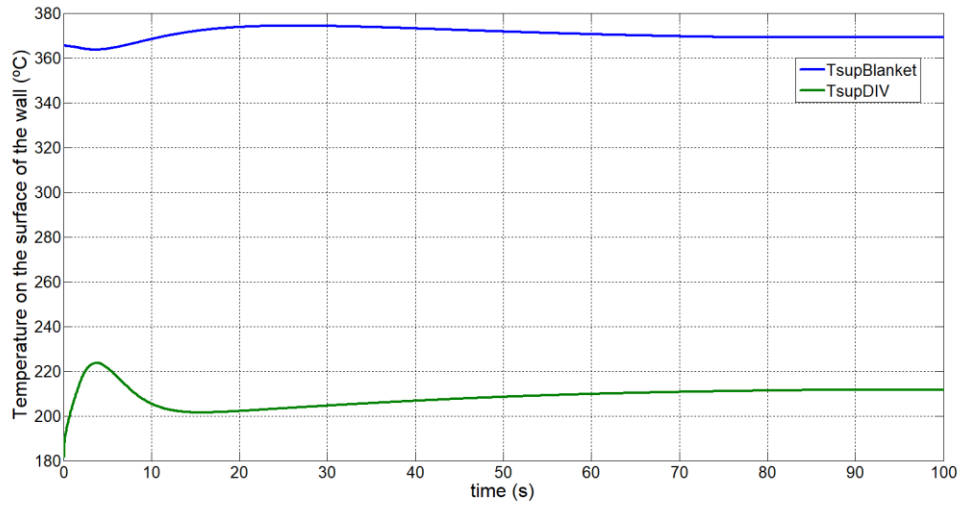


Figure 376: WCLL DEMO1 Auxiliary Heating sudden increase x6 Temperature on the surface of the blanket and divertor wall graphic.

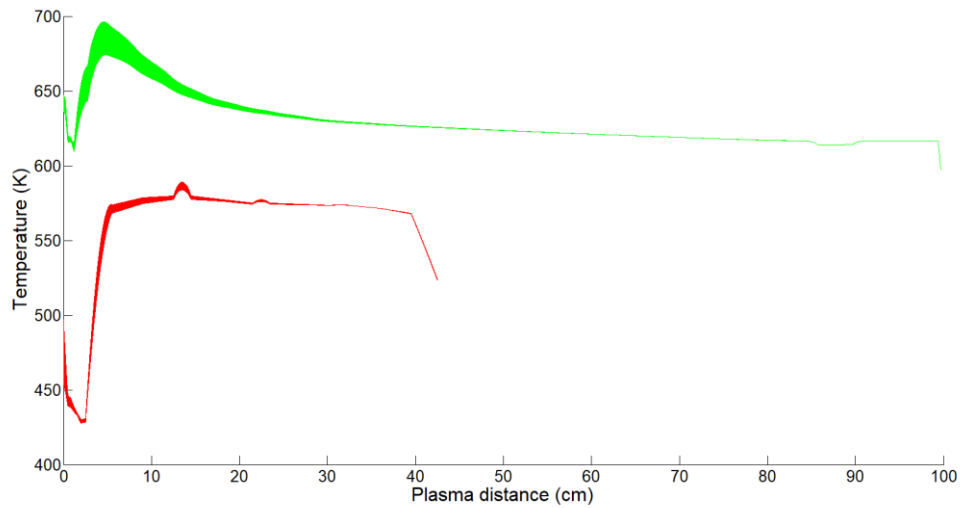


Figure 377: WCLL DEMO1 Auxiliary Heating sudden increase x6 evolution of the BB and divertor temperature graphic.

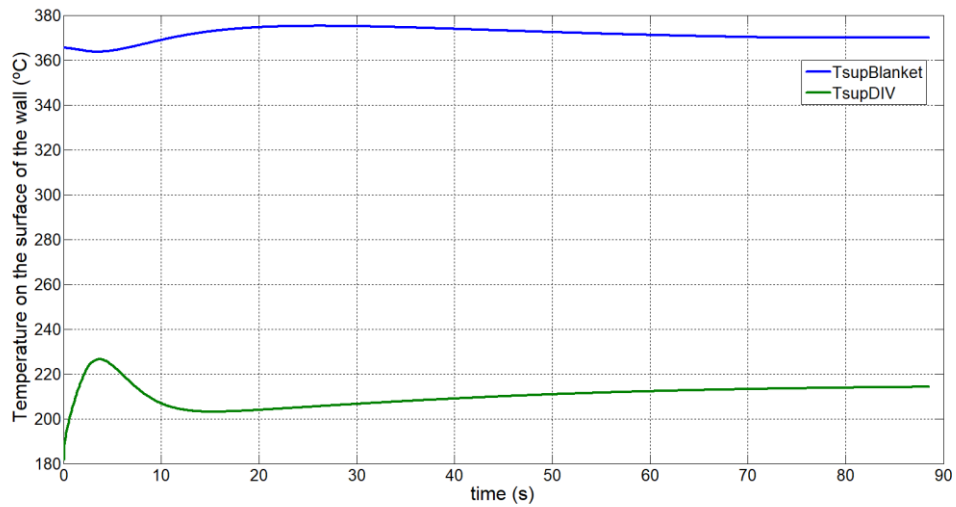


Figure 378: WCLL DEMO1 Auxiliary Heating sudden increase x6.4 Temperature on the surface of the blanket and divertor wall graphic.



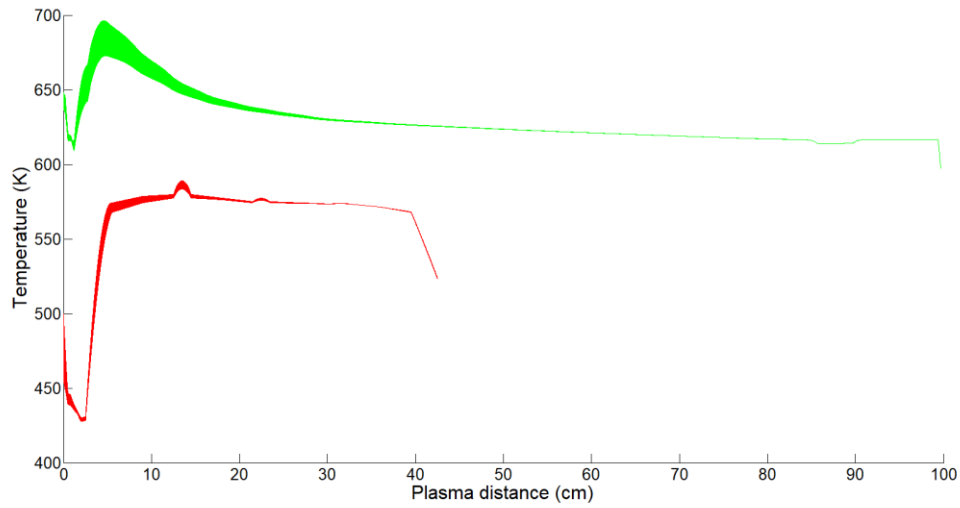


Figure 379: WCLL DEMO1 Auxiliary Heating sudden increase x6.4 evolution of the BB and divertor temperature graphic.

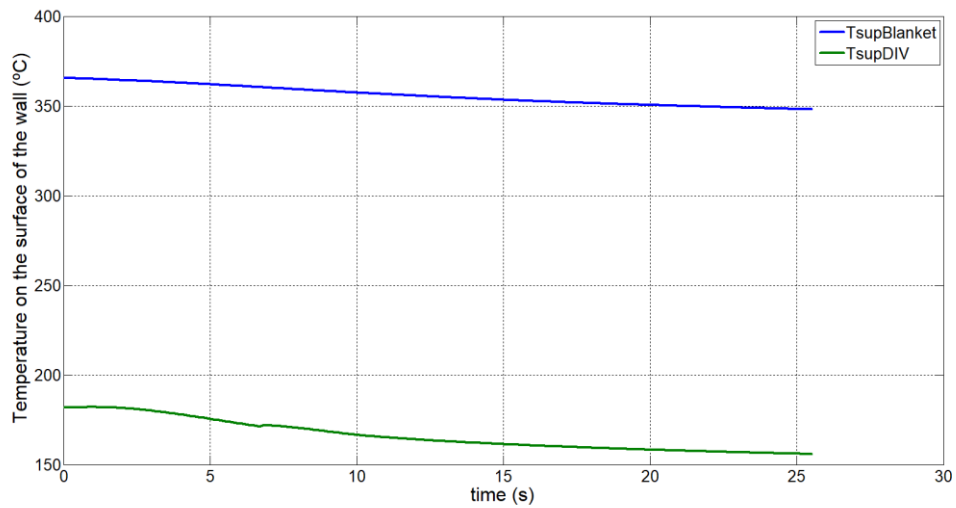


Figure 380: WCLL DEMO1 Fueling Rate Cut-off Temperature on the surface of the blanket and divertor wall graphic.

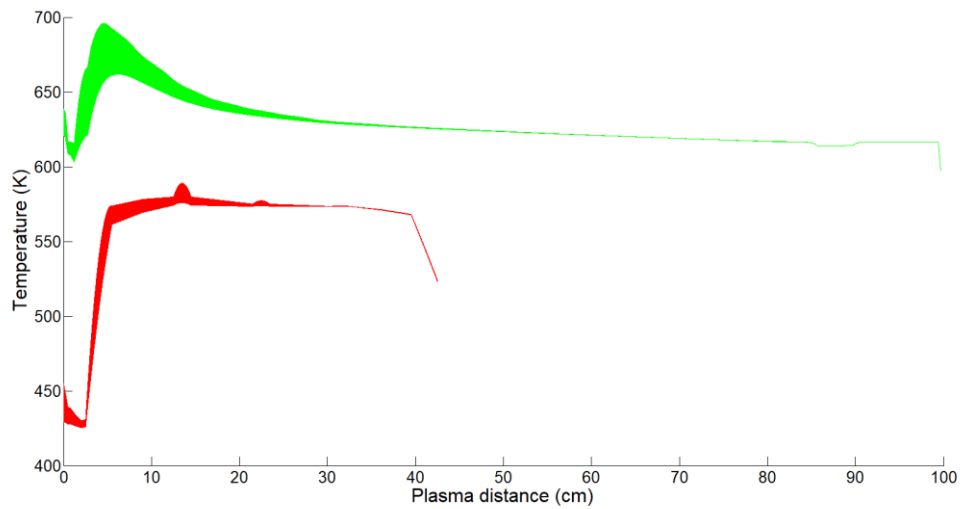


Figure 381: WCLL DEMO1 Fueling Rate Cut-off evolution of the BB and divertor temperature graphic.

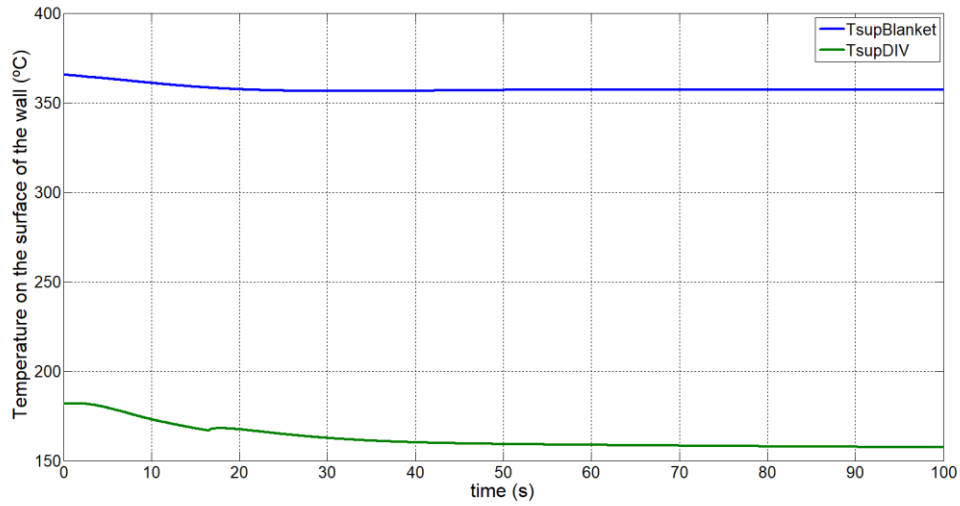


Figure 382: WCLL DEMO1 Fueling Rate sudden decrease x0.5 Temperature on the surface of the blanket and divertor wall graphic.

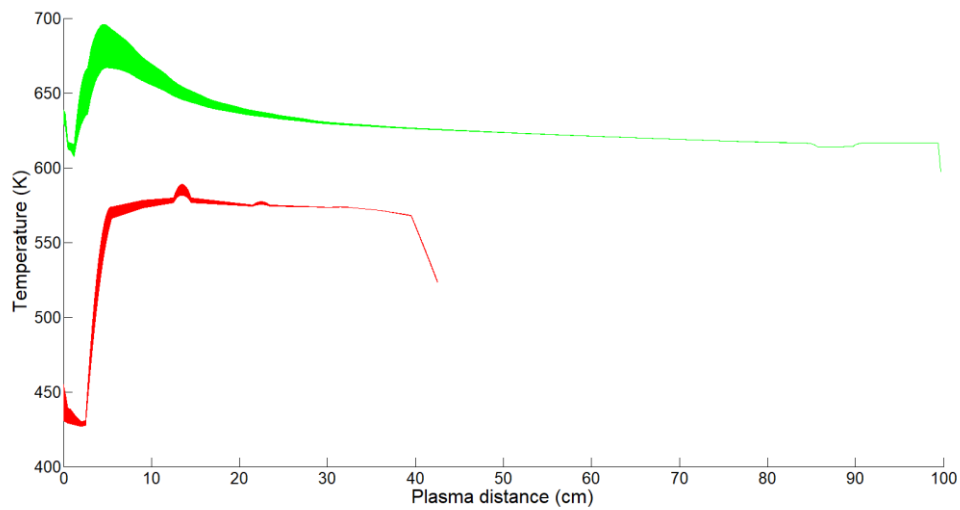


Figure 383: WCLL DEMO1 Fueling Rate sudden decrease x0.5 evolution of the BB and divertor temperature graphic.

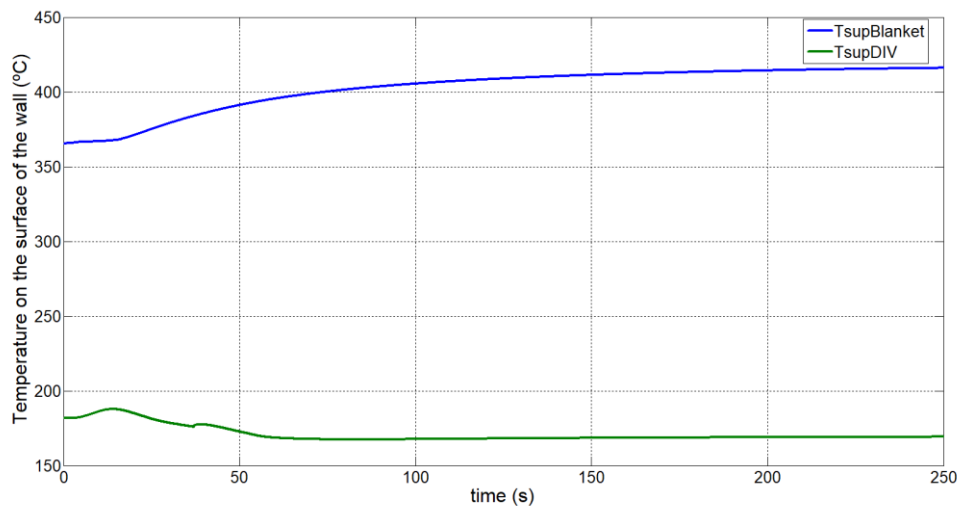


Figure 384: WCLL DEMO1 Fueling Rate sudden increase x1.25 Temperature on the surface of the blanket and divertor wall graphic.

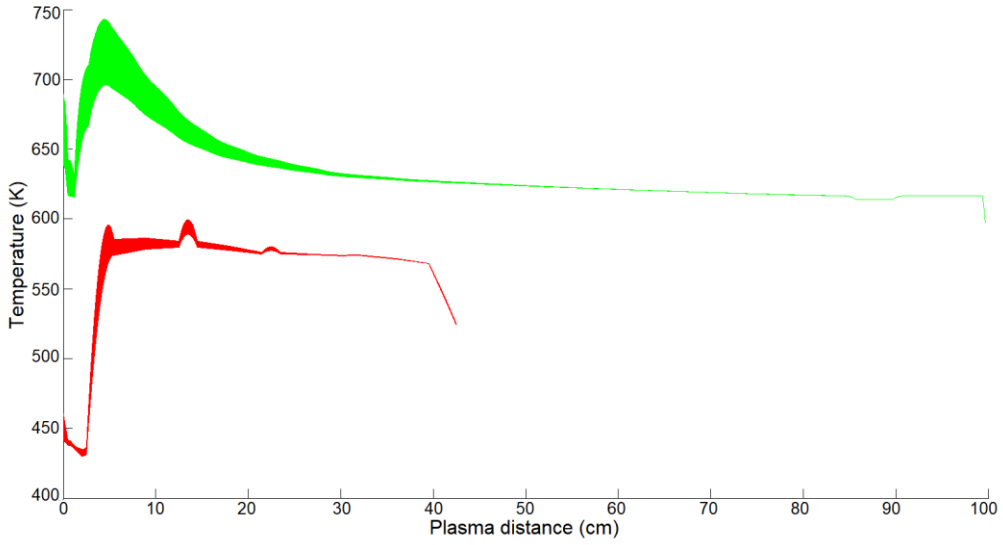


Figure 385: WCLL DEMO1 Fueling Rate sudden increase x1.25 evolution of the BB and divertor temperature graphic.

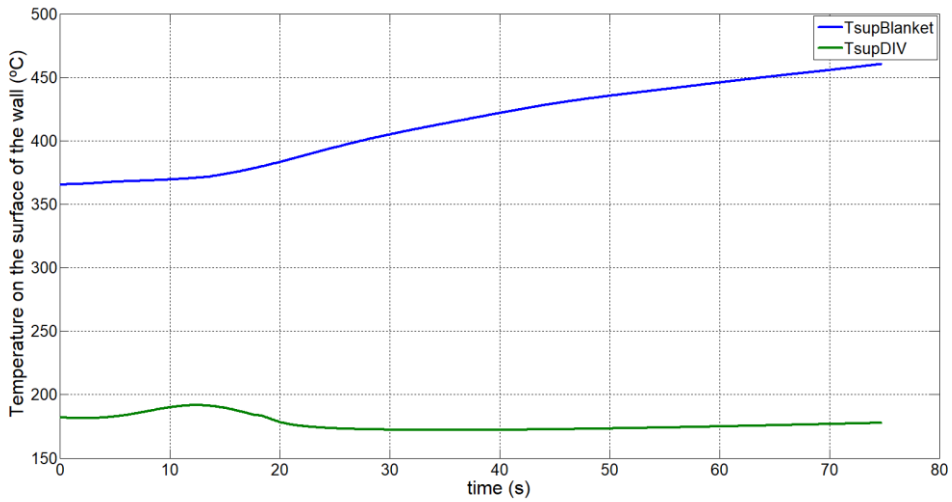


Figure 386: WCLL DEMO1 Fueling Rate sudden increase x1.5 Temperature on the surface of the blanket and divertor wall graphic.

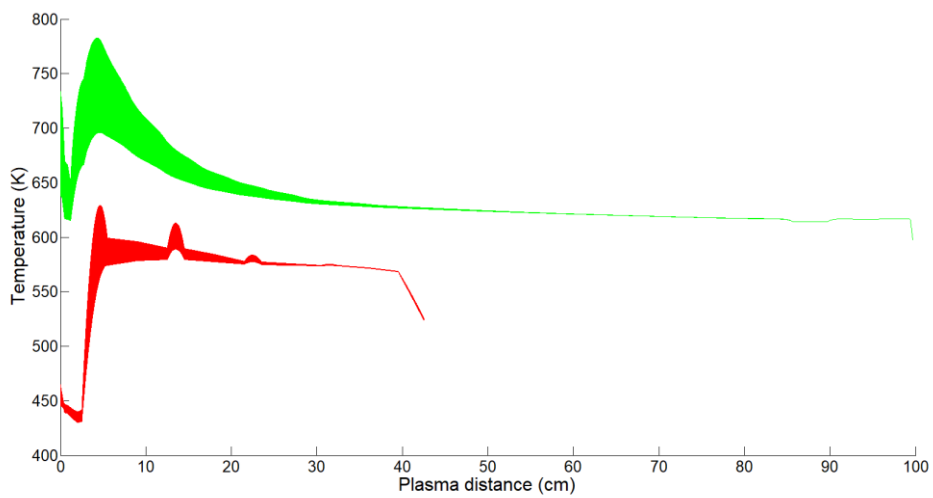


Figure 387: WCLL DEMO1 Fueling Rate sudden increase x1.5 evolution of the BB and divertor temperature graphic.

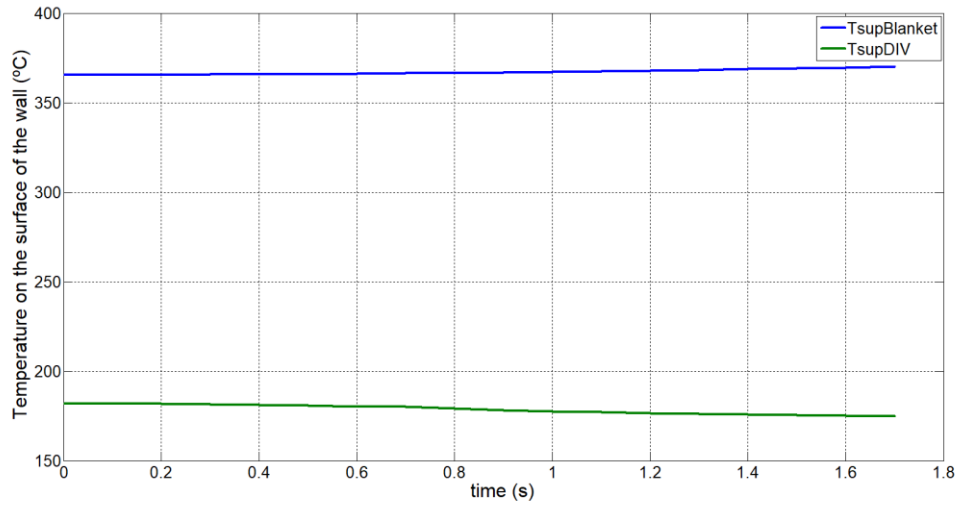


Figure 388: WCLL DEMO1 Fueling Rate sudden increase x6 Temperature on the surface of the blanket and divertor wall graphic.

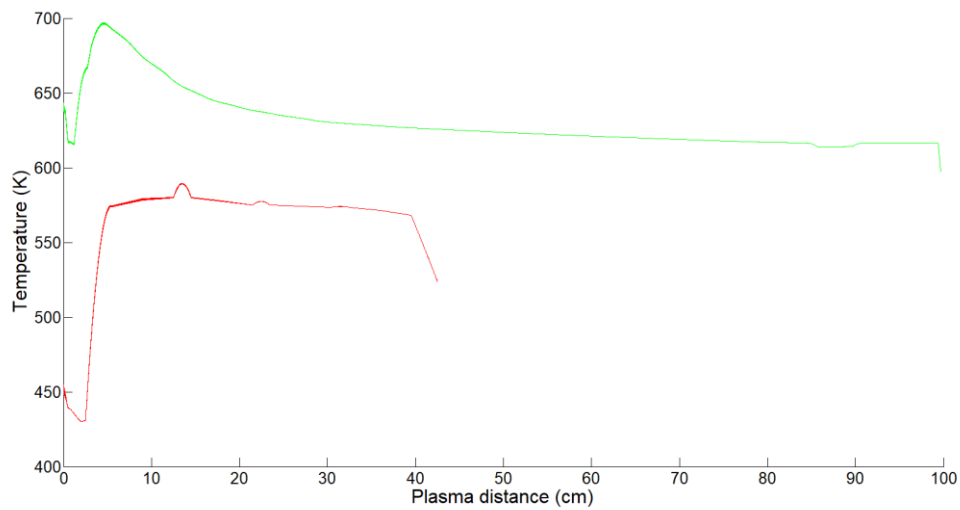


Figure 389: WCLL DEMO1 Fueling Rate sudden increase x6 evolution of the BB and divertor temperature graphic.

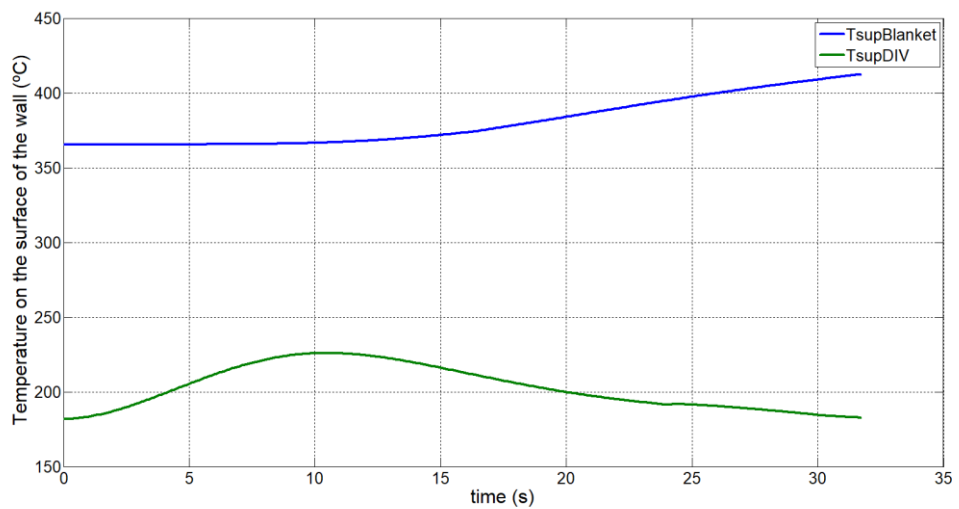


Figure 390: WCLL DEMO1 Confinement time improvement x1.5 Temperature on the surface of the blanket and divertor wall graphic.

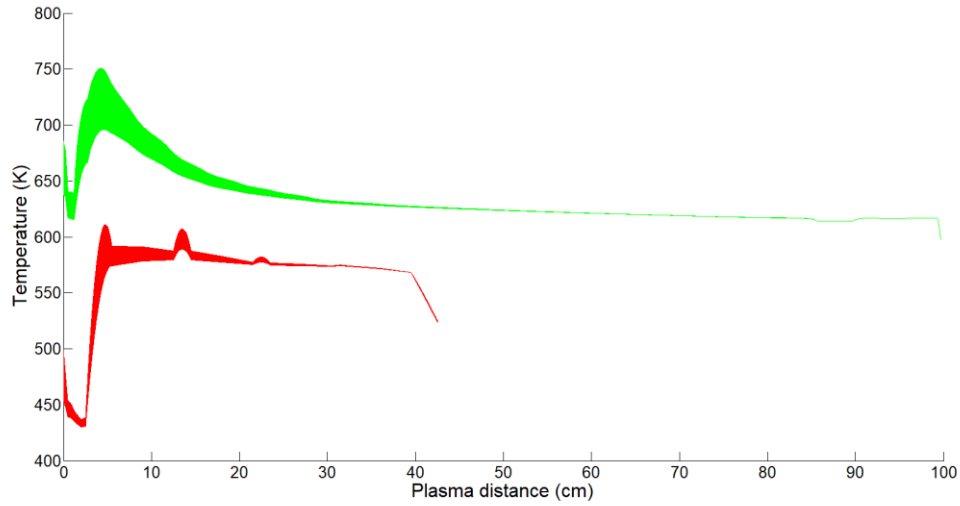


Figure 391: WCLL DEMO1 Confinement time improvement x1.5 evolution of the BB and divertor temperature graphic.

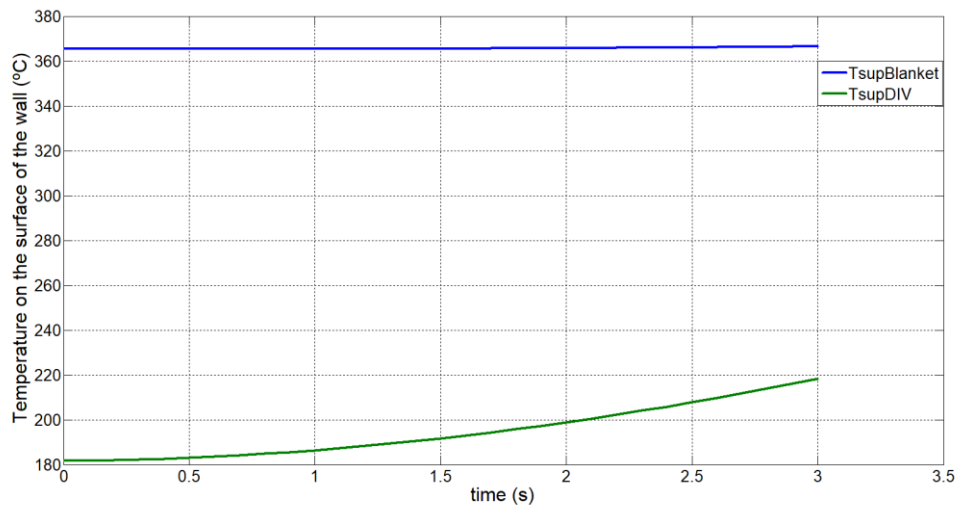


Figure 392: WCLL DEMO1 Confinement time improvement x5 Temperature on the surface of the blanket and divertor wall graphic.

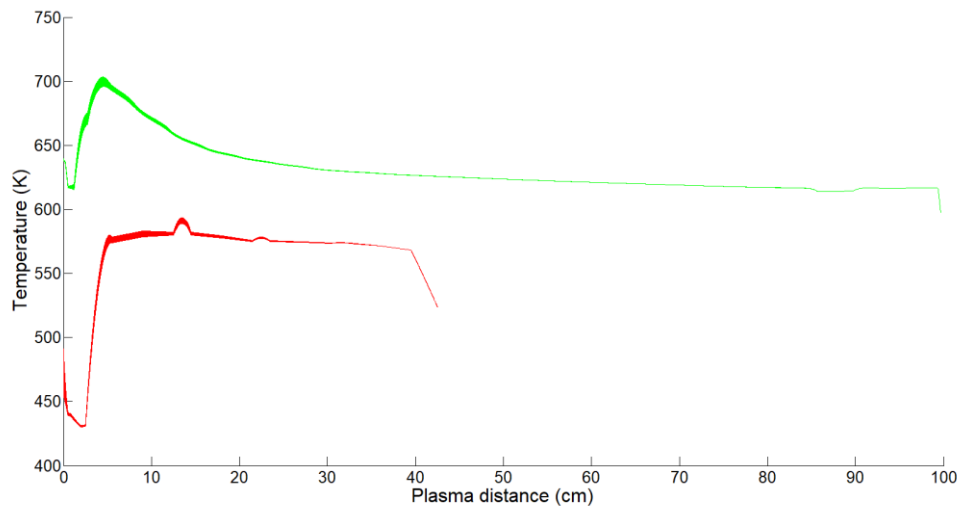


Figure 393: WCLL DEMO1 Confinement time improvement x5 evolution of the BB and divertor temperature graphic.

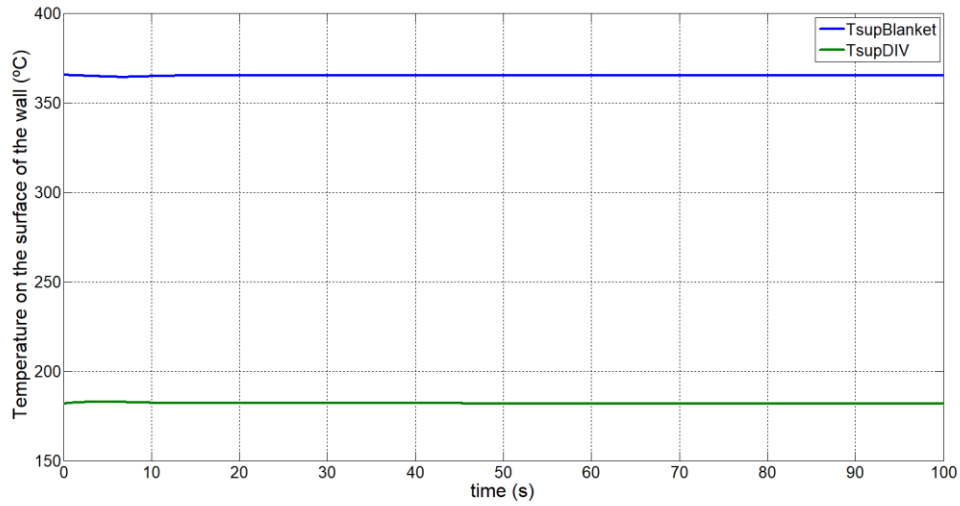


Figure 394: WCLL DEMO1 Occasional confinement time improvement x3 Temperature on the surface of the blanket and divertor wall graphic.

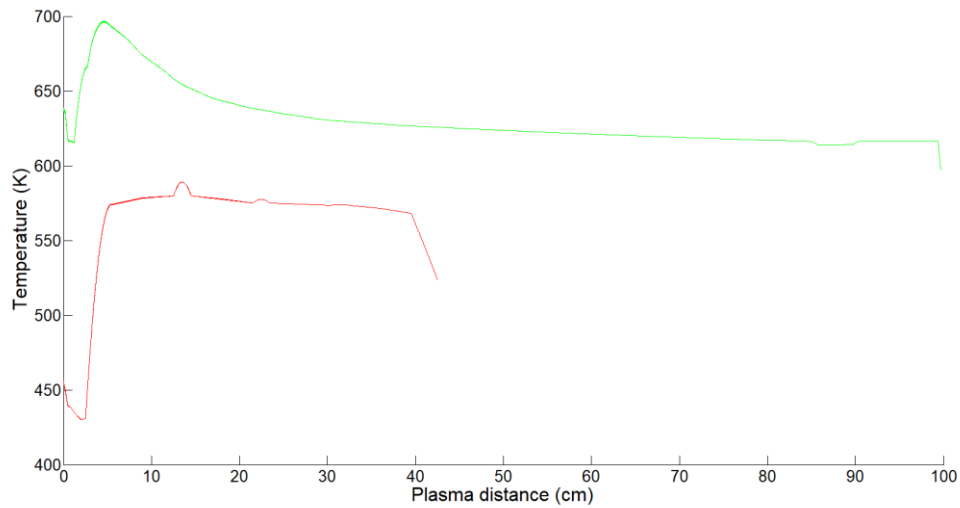


Figure 395: WCLL DEMO1 Occasional confinement time improvement x3 evolution of the BB and divertor temperature graphic.

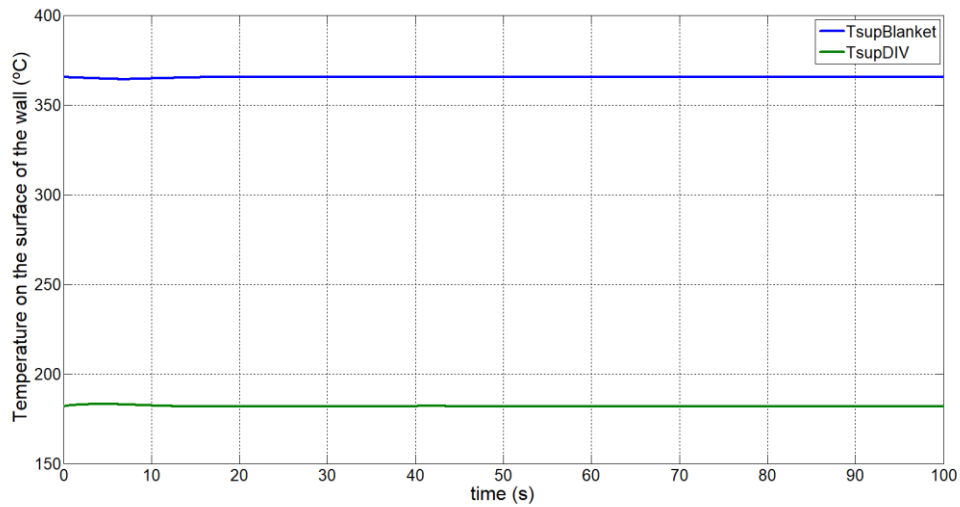


Figure 396: WCLL DEMO1 Occasional confinement time improvement x10 Temperature on the surface of the blanket and divertor wall graphic.

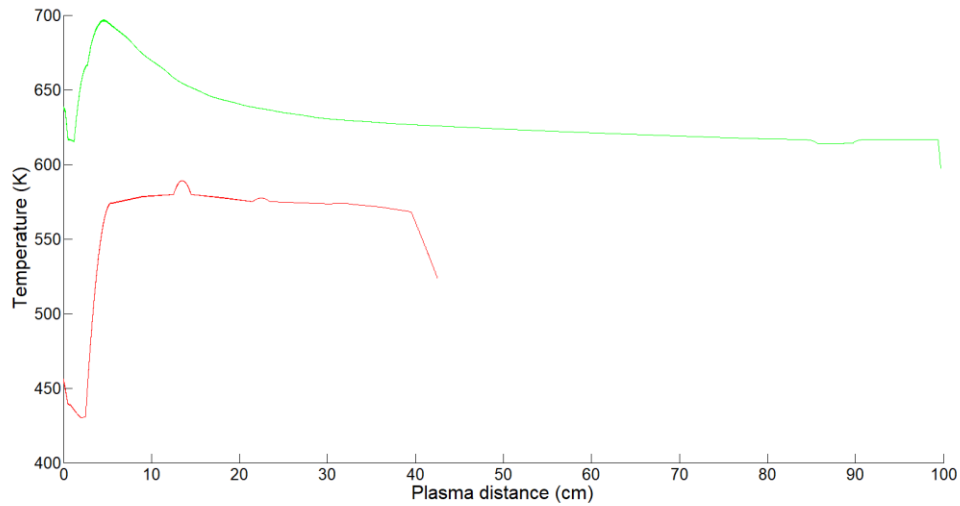


Figure 397: WCLL DEMO1 Occasional confinement time improvement x10 evolution of the BB and divertor temperature graphic.

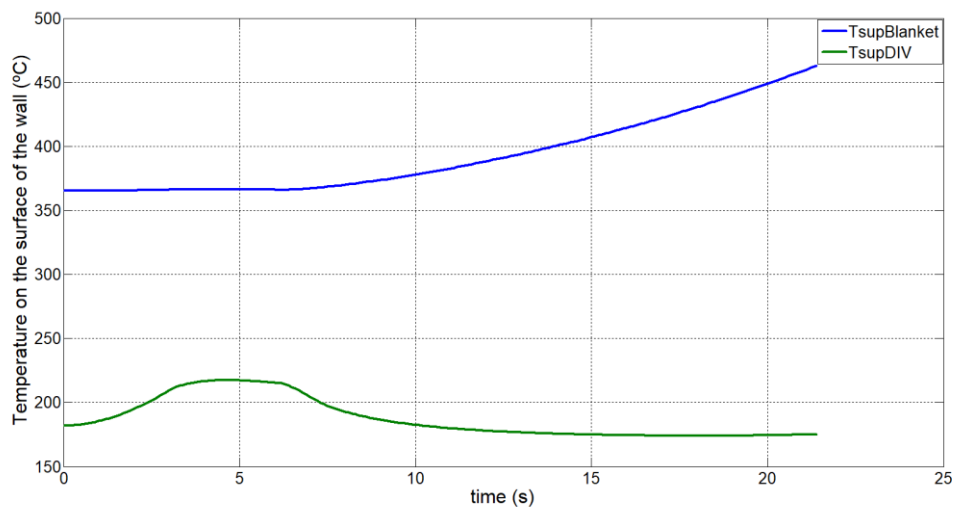


Figure 398: WCLL DEMO1 Occasional confinement time improvement x3 (during 3s) Temperature on the surface of the blanket and divertor wall graphic.

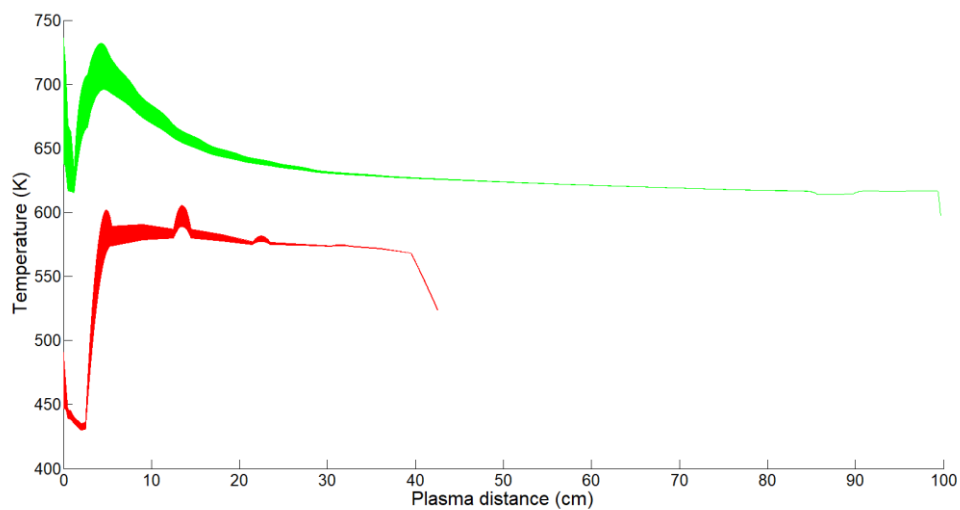


Figure 399: WCLL DEMO1 Occasional confinement time improvement x3 (during 3s) evolution of the BB and divertor temperature graphic.

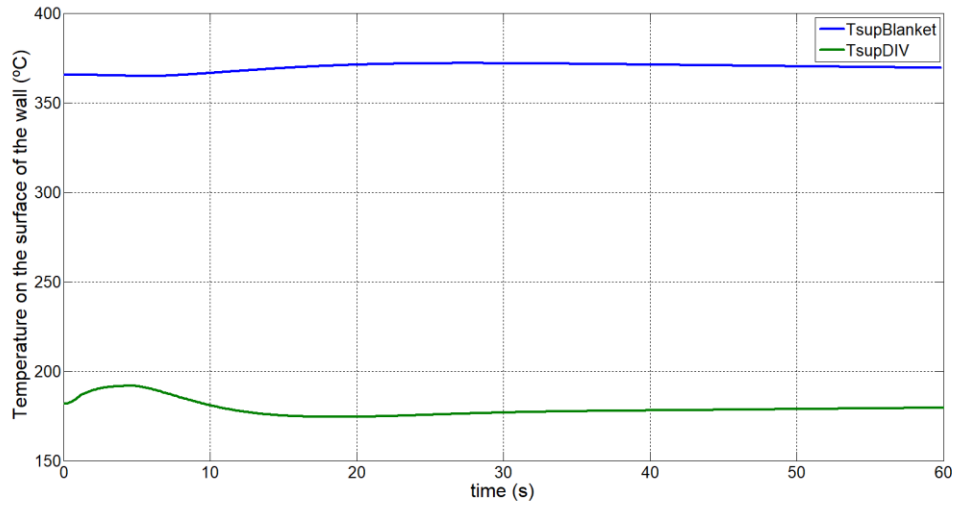


Figure 400: WCLL DEMO1 Occasional confinement time improvement x3 (during 1s) Temperature on the surface of the blanket and divertor wall graphic.

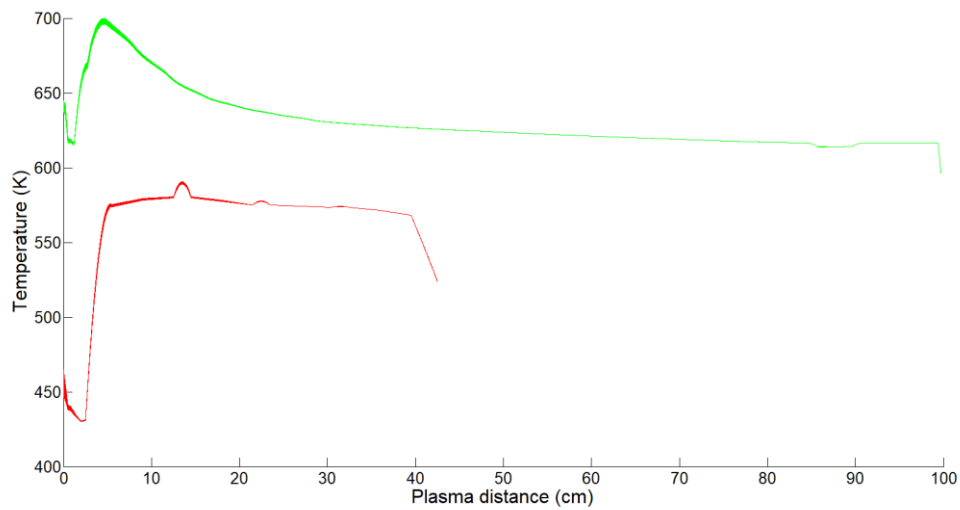


Figure 401: WCLL DEMO1 Occasional confinement time improvement x3 (during 1s) evolution of the BB and divertor temperature graphic.

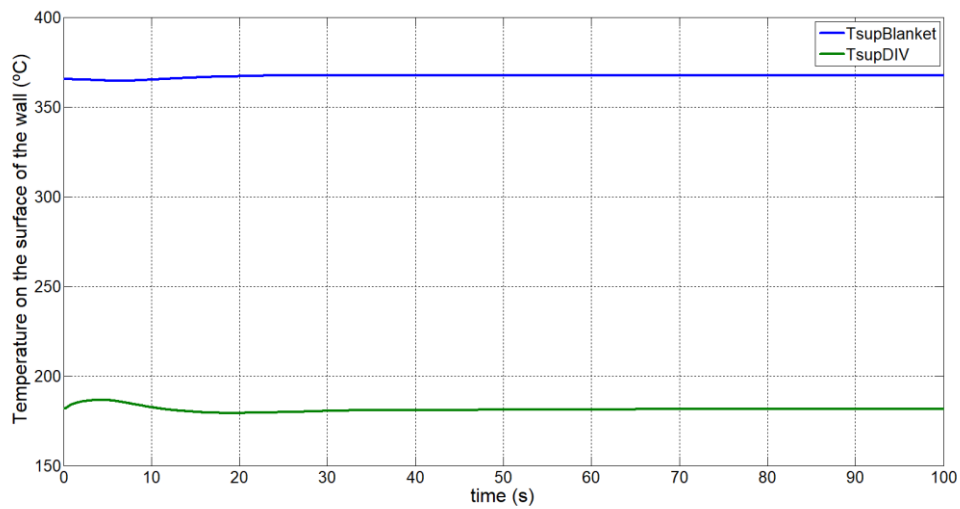


Figure 402: WCLL DEMO1 Occasional confinement time improvement x3 (during 0.5s) Temperature on the surface of the blanket and divertor wall graphic.



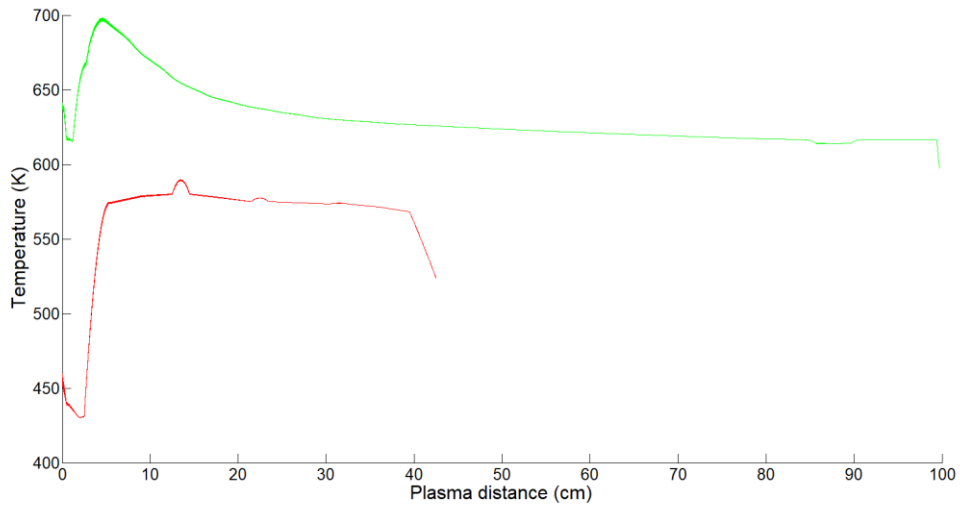


Figure 403: WCLL DEMO1 Occasional confinement time improvement x3 (during 0.5s) evolution of the BB and divertor temperature graphic.

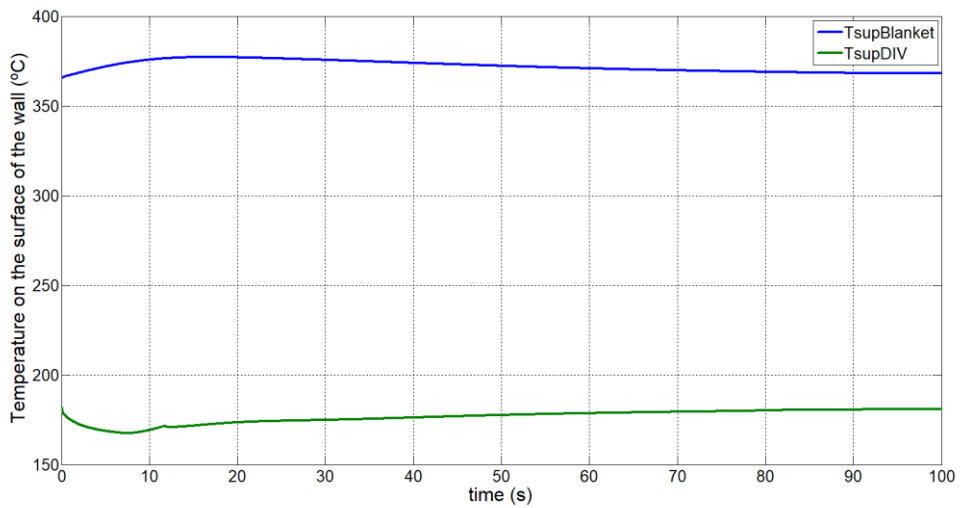


Figure 404: WCLL DEMO1 Punctual impurities entrance x1.5 Temperature on the surface of the blanket and divertor wall graphic.

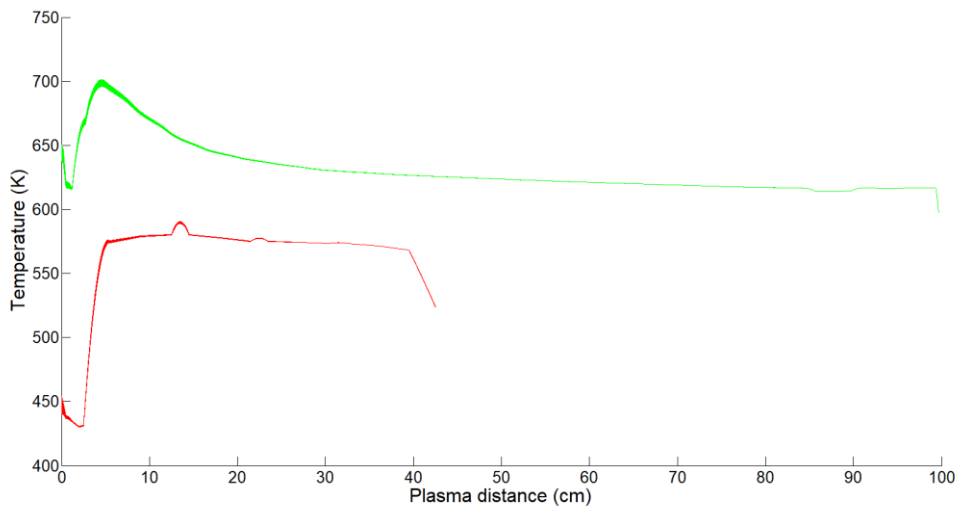


Figure 405: WCLL DEMO1 Punctual impurities entrance x1.5 evolution of the BB and divertor temperature graphic.

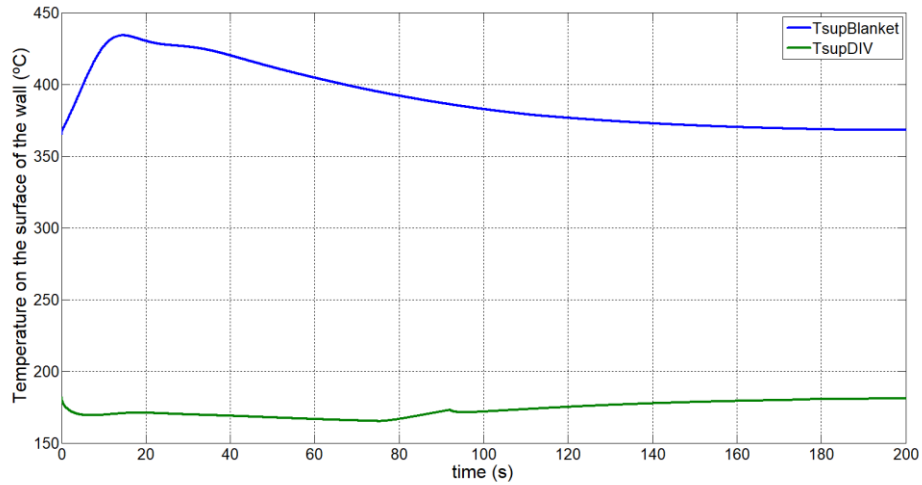


Figure 406: WCLL DEMO1 Punctual impurities entrance x2.9 Temperature on the surface of the blanket and divertor wall graphic.

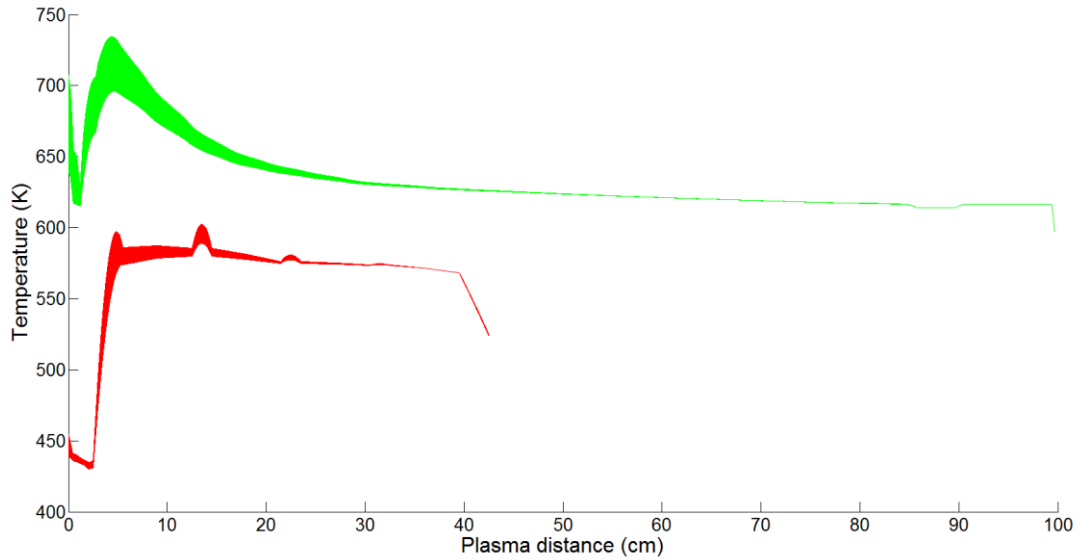


Figure 407: WCLL DEMO1 Punctual impurities entrance x2.9 evolution of the BB and divertor temperature graphic.

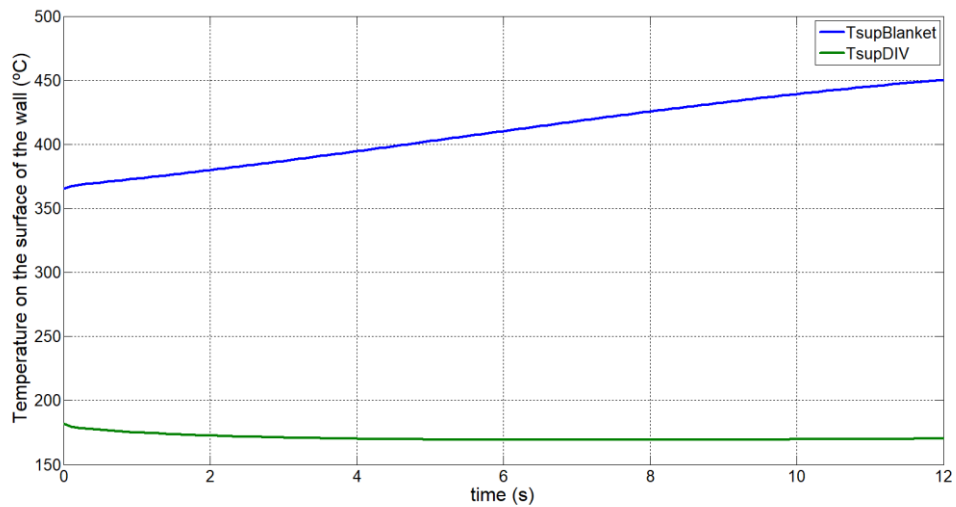


Figure 408: WCLL DEMO1 Punctual impurities entrance x3 Temperature on the surface of the blanket and divertor wall graphic.

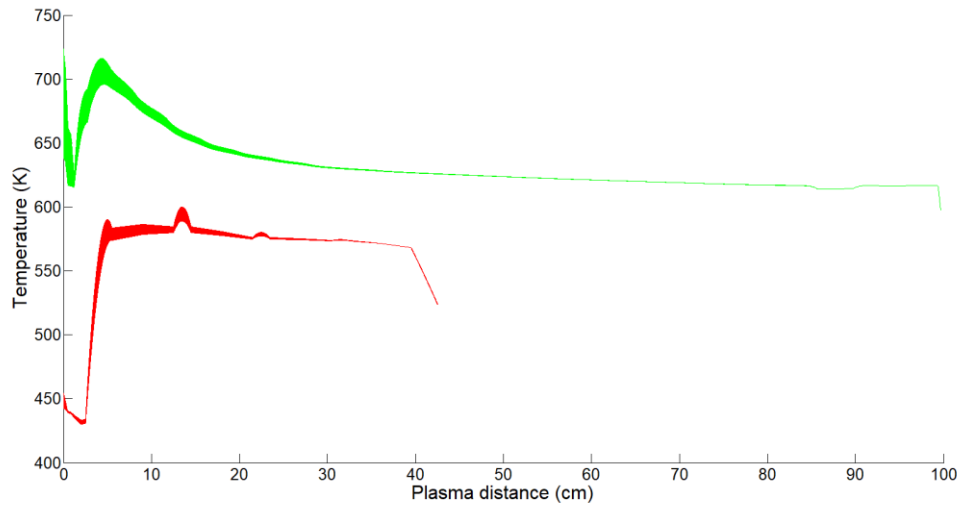


Figure 409: WCLL DEMO1 Punctual impurities entrance x3 evolution of the BB and divertor temperature graphic.

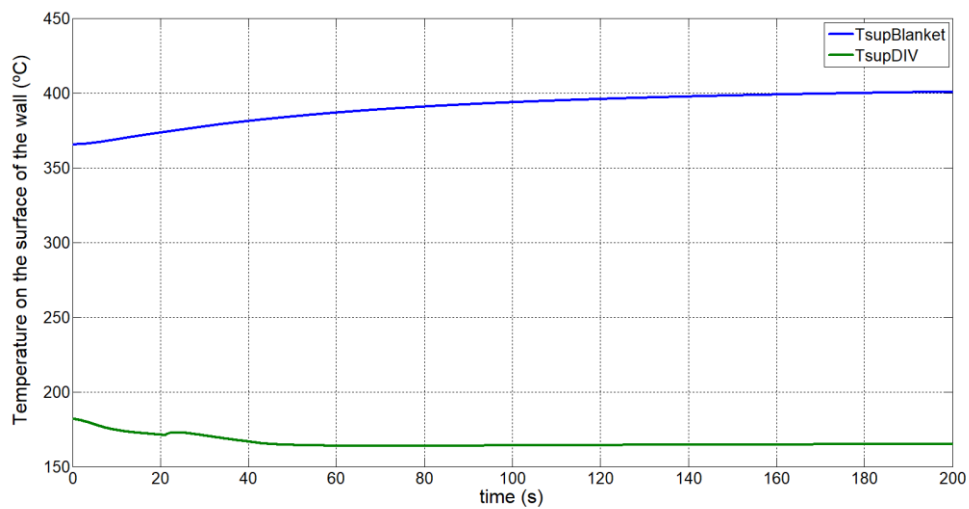


Figure 410: WCLL DEMO1 Tungsten permanent entrance x4 Temperature on the surface of the blanket and divertor wall graphic.

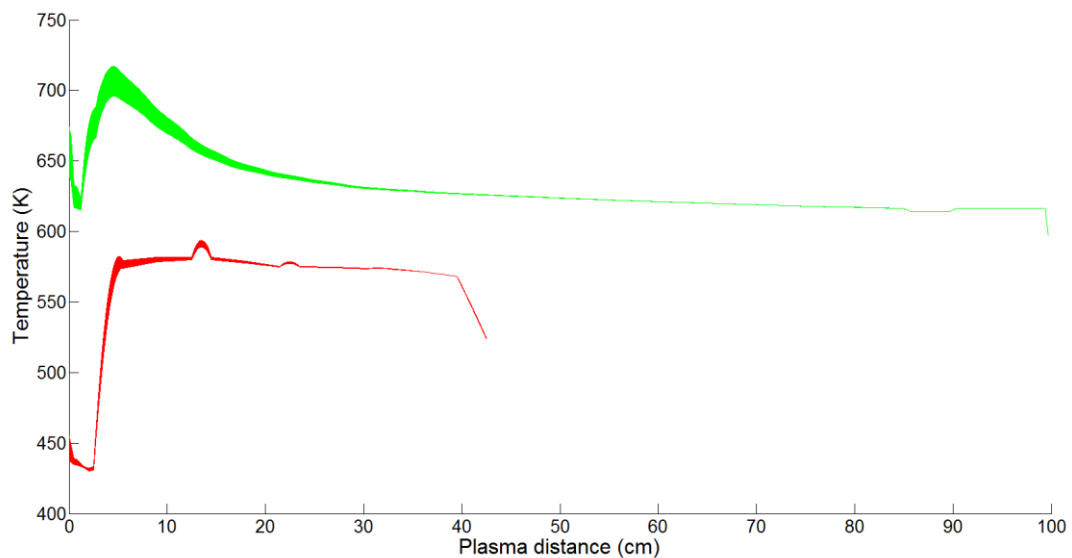


Figure 411: WCLL DEMO1 Tungsten permanent entrance x4 evolution of the BB and divertor temperature graphic.

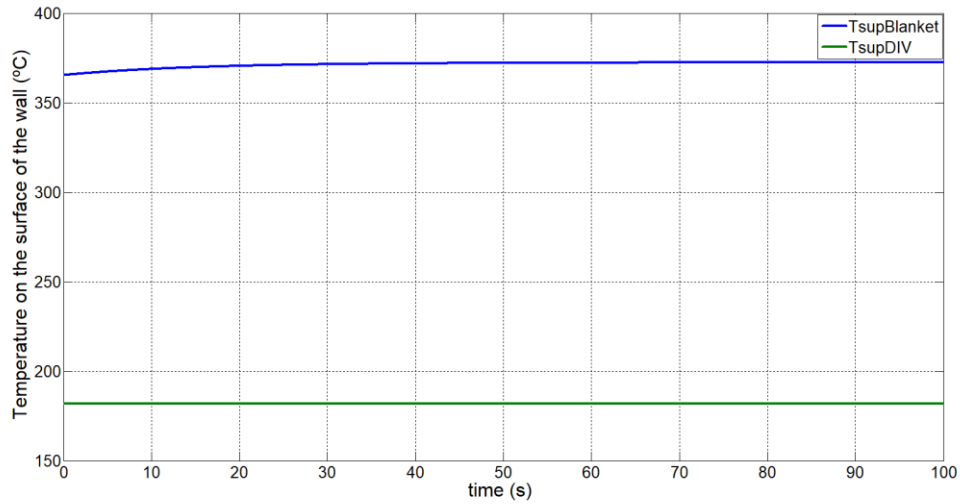


Figure 412: WCLL DEMO1 BB LOCA 30% in all the cooling loops (FW and internal channels). Temperature on the surface of the blanket and divertor wall graphic.

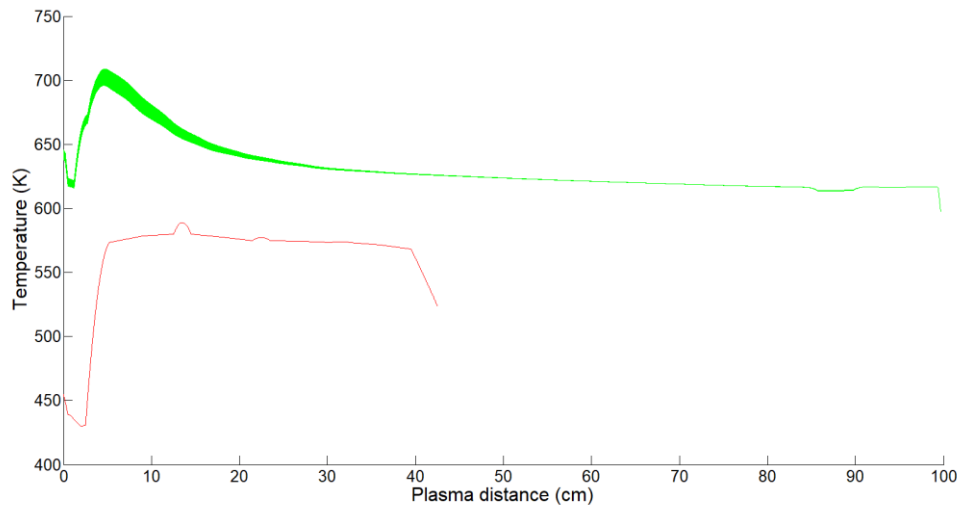


Figure 413: WCLL DEMO1 BB LOCA 30% in all the cooling loops (FW and internal channels). Evolution of the BB and divertor temperature graphic.

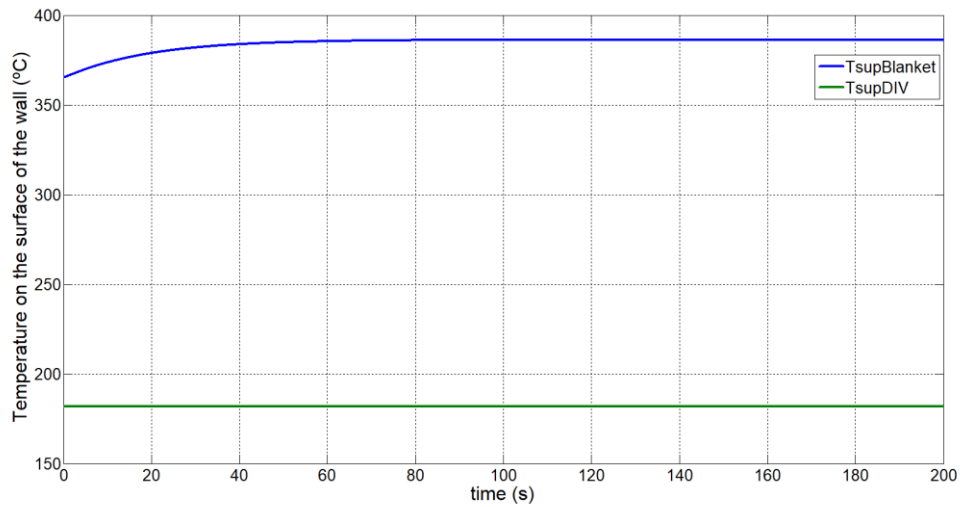


Figure 414: WCLL DEMO1 BB LOCA 60% in all the cooling loops (FW and internal channels). Temperature on the surface of the blanket and divertor wall graphic.

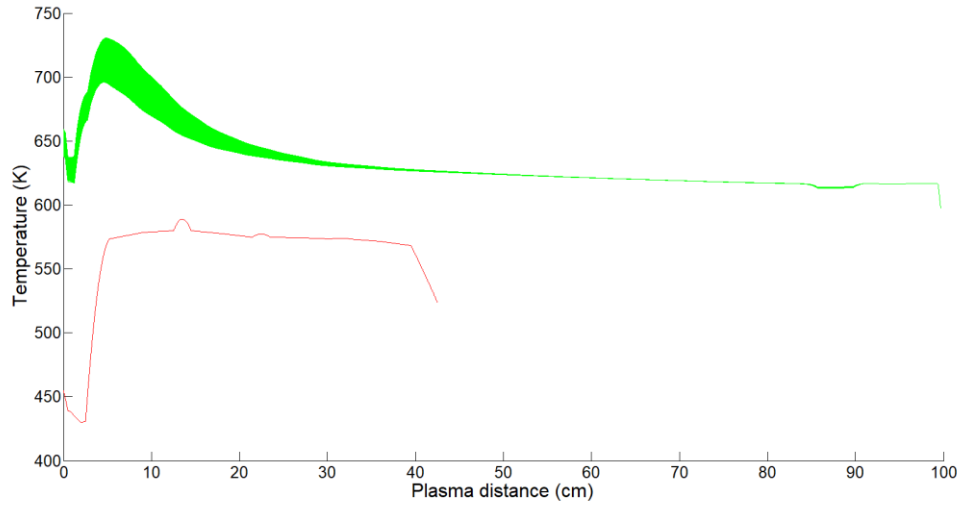


Figure 415: WCLL DEMO1 BB LOCA 60% in all the cooling loops (FW and internal channels). Evolution of the BB and divertor temperature graphic.

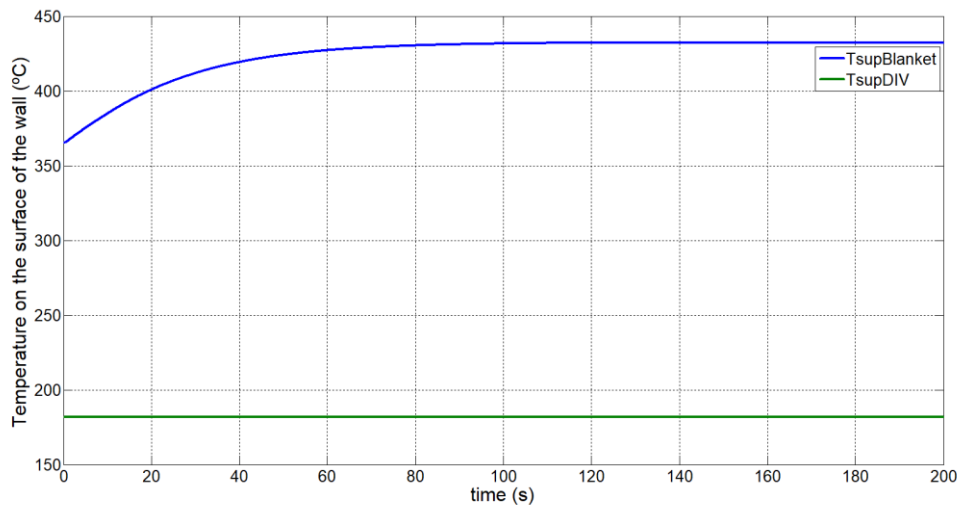


Figure 416: WCLL DEMO1 BB LOCA 90% in all the cooling loops (FW and internal channels). Temperature on the surface of the blanket and divertor wall graphic.

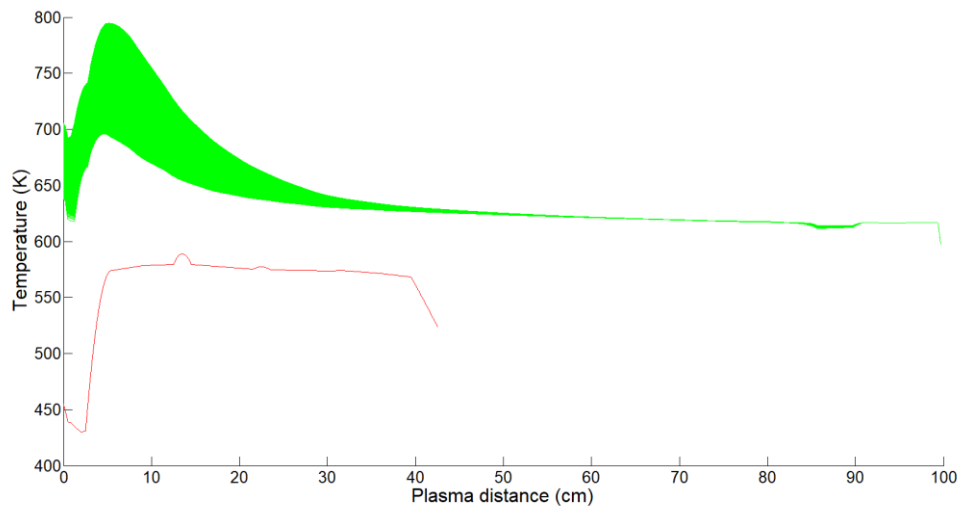


Figure 417: WCLL DEMO1 BB LOCA 90% in all the cooling loops (FW and internal channels). Evolution of the BB and divertor temperature graphic.

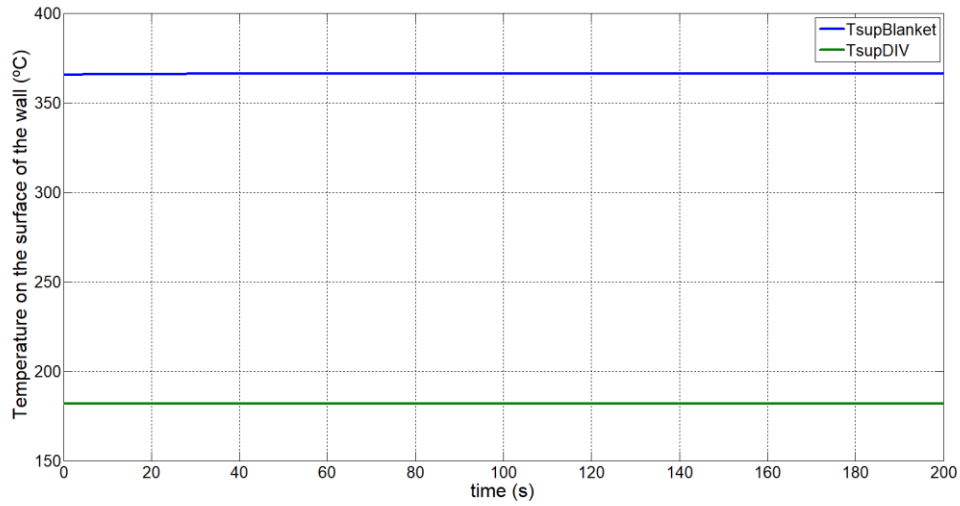


Figure 418: WCLL DEMO1 BB LOCA 90% in the internal channels. Temperature on the surface of the blanket and divertor wall graphic.

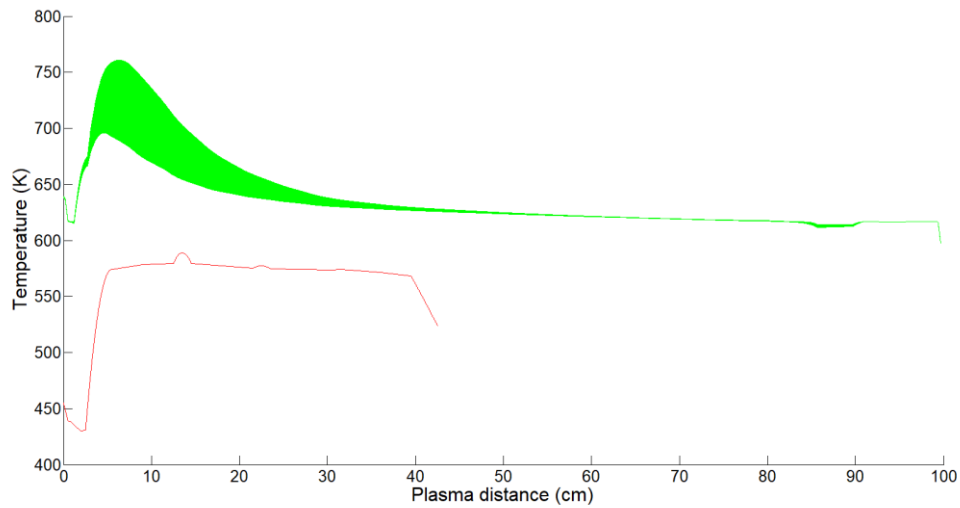


Figure 419: WCLL DEMO1 BB LOCA 90% in the internal channels. Evolution of the BB and divertor temperature graphic.

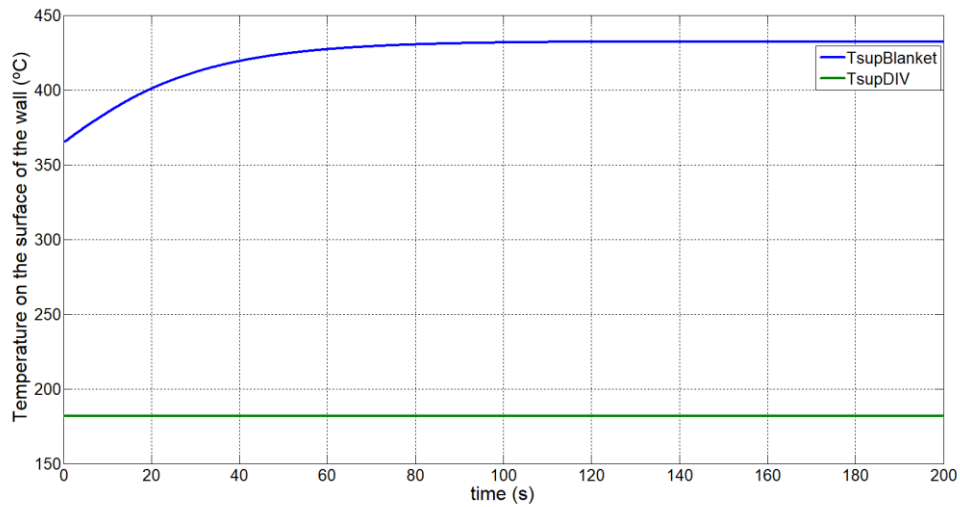


Figure 420: WCLL DEMO1 BB LOCA 90% in the FW cooling loop. Temperature on the surface of the blanket and divertor wall graphic.

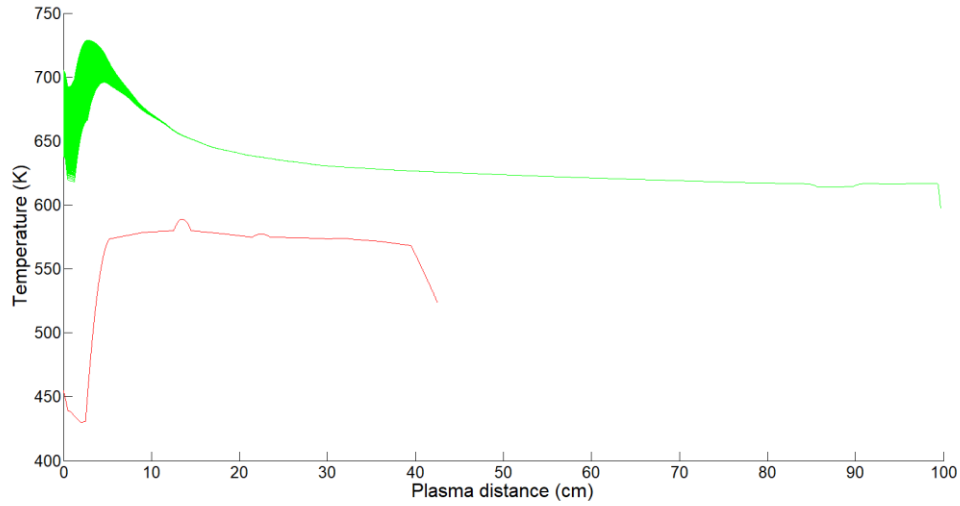


Figure 421: WCLL DEMO1 BB LOCA 90% in the FW cooling loop. Evolution of the BB and divertor temperature graphic.

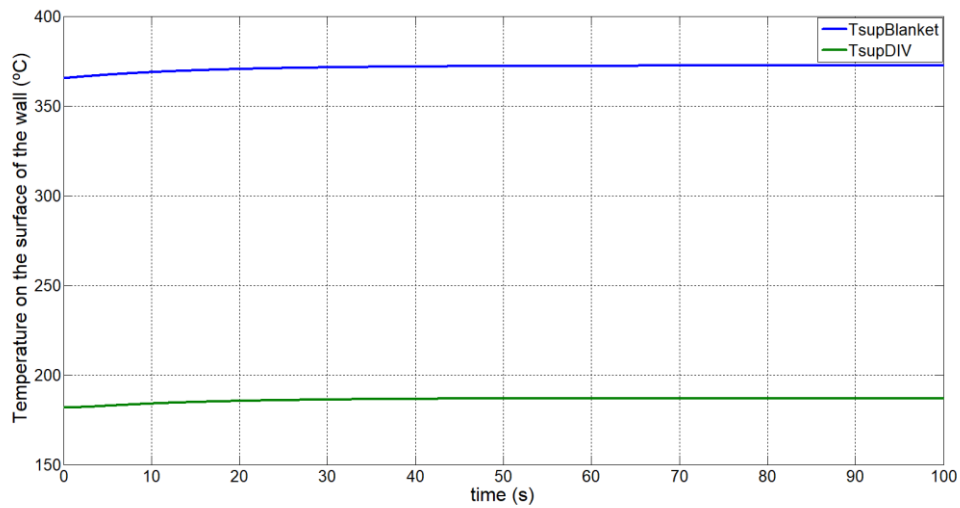


Figure 422: WCLL DEMO1 Divertor and BB LOCA 30% in all the cooling loops. Temperature on the surface of the blanket and divertor wall graphic.

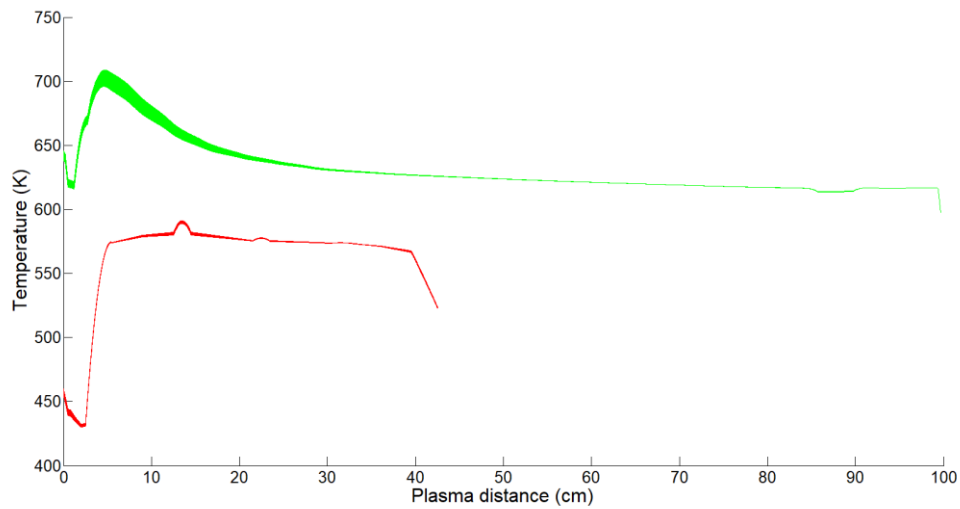


Figure 423: WCLL DEMO1 Divertor and BB LOCA 30% in all the cooling loops. Evolution of the BB and divertor temperature graphic.

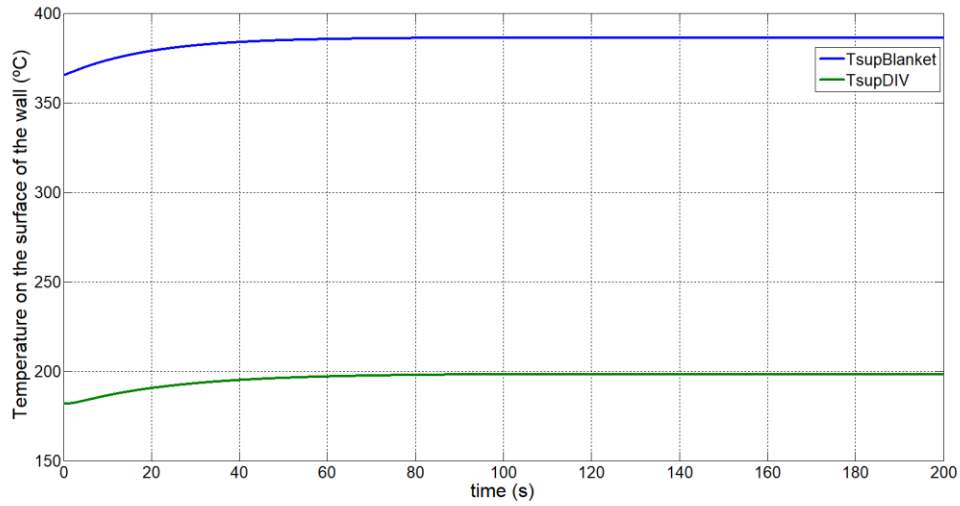


Figure 424: WCLL DEMO1 Divertor and BB LOCA 60% in all the cooling loops. Temperature on the surface of the blanket and divertor wall graphic.

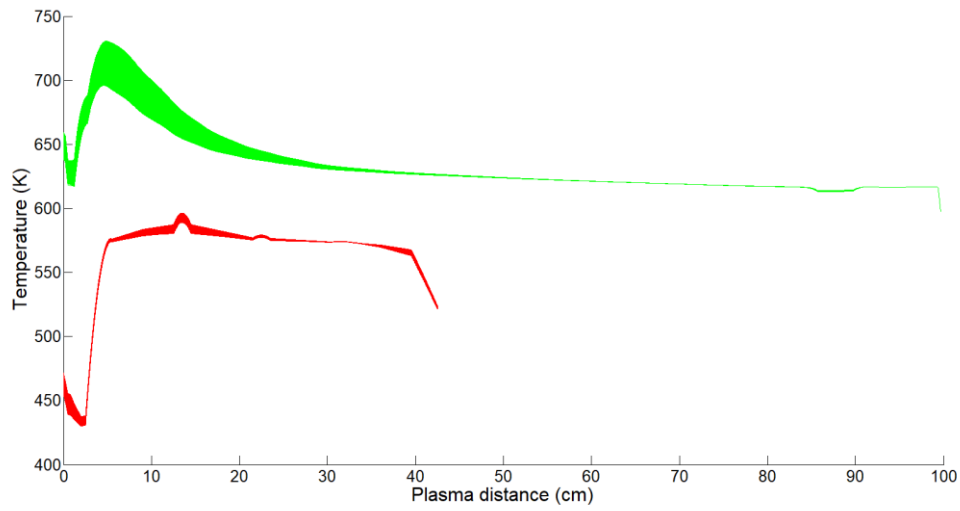


Figure 425: WCLL DEMO1 Divertor and BB LOCA 60% in all the cooling loops. Evolution of the BB and divertor temperature graphic.

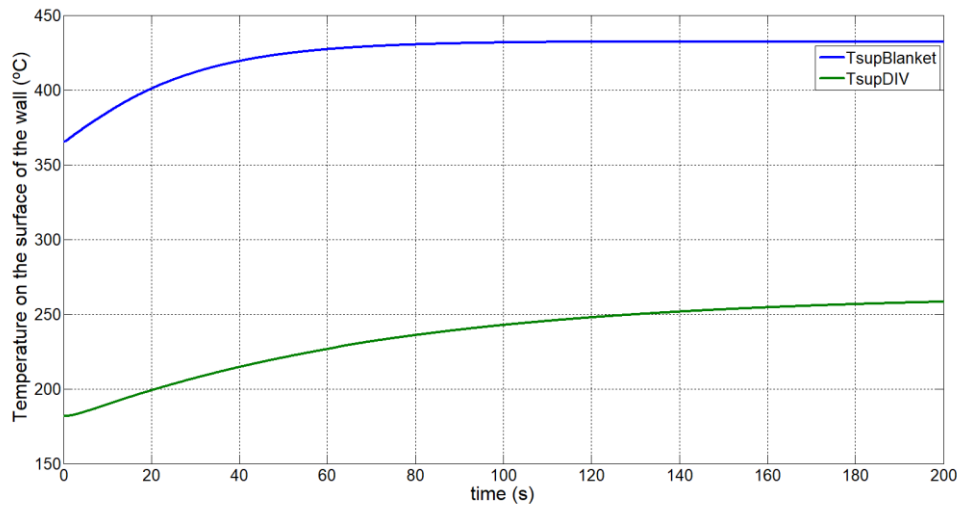


Figure 426: WCLL DEMO1 Divertor and BB LOCA 90% in all the cooling loops. Temperature on the surface of the blanket and divertor wall graphic.



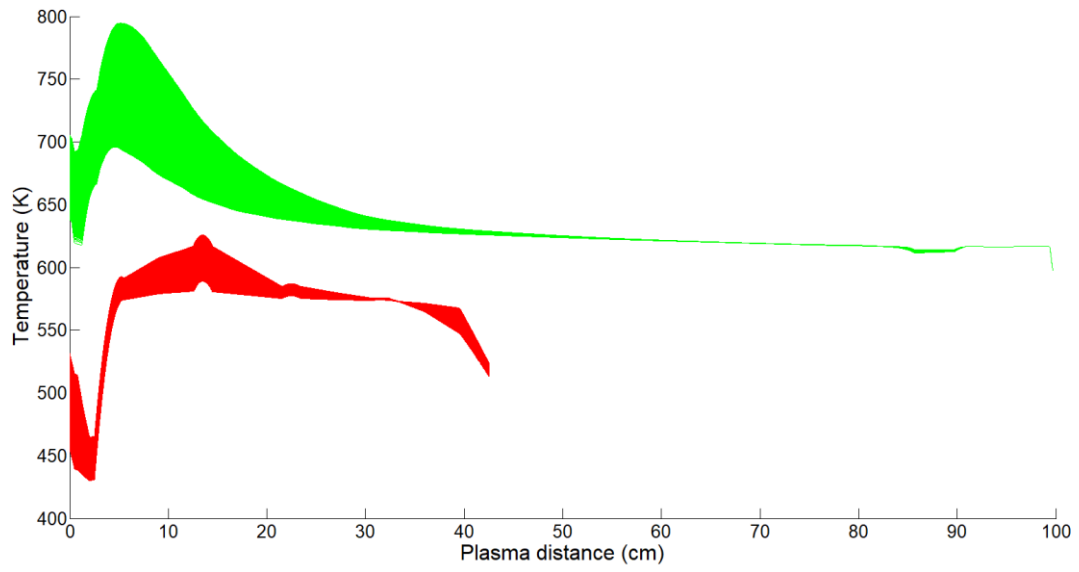


Figure 427: WCLL DEMO1 Divertor and BB LOCA 90% in all the cooling loops. Evolution of the BB and divertor temperature graphic.

## ANNEX E: DEMO2 graphics

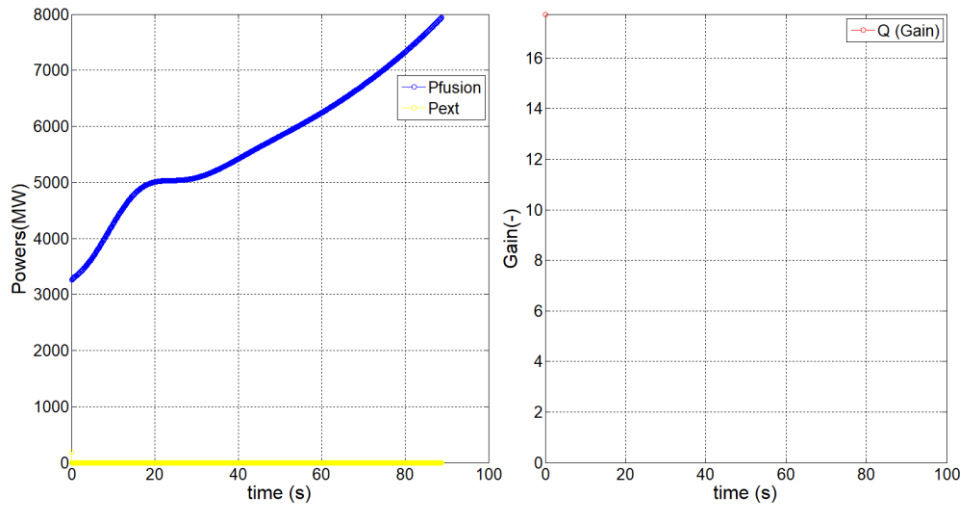


Figure 428: HCLL DEMO2 Auxiliary Heating Cut-off  $P_{fus}$  and gain graphic.

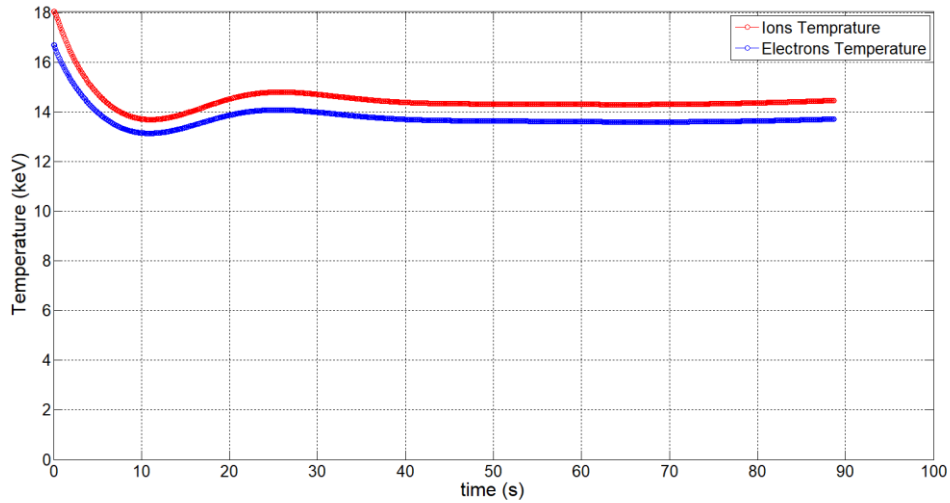


Figure 429: HCLL DEMO2 Auxiliary Heating Cut-off Temperatures graphic.

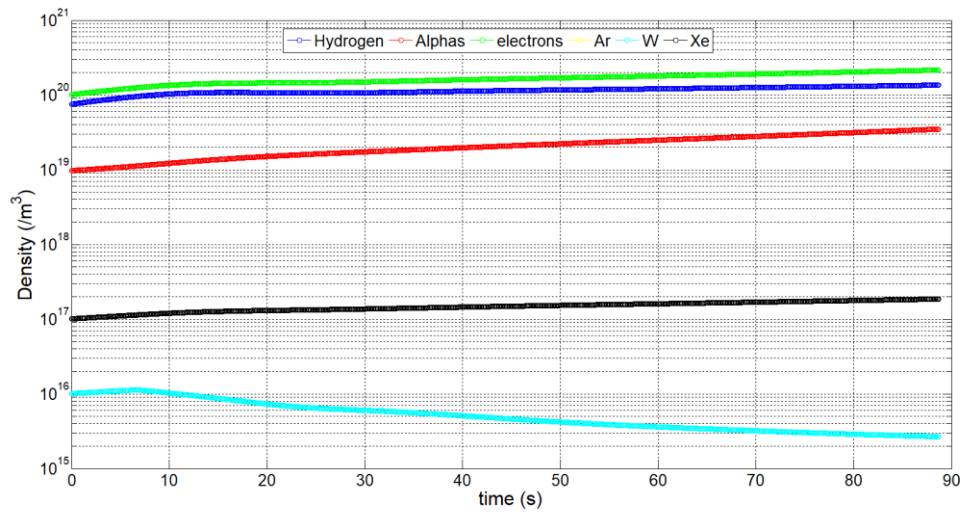


Figure 430: HCLL DEMO2 Auxiliary Heating Cut-off Densities graphic.

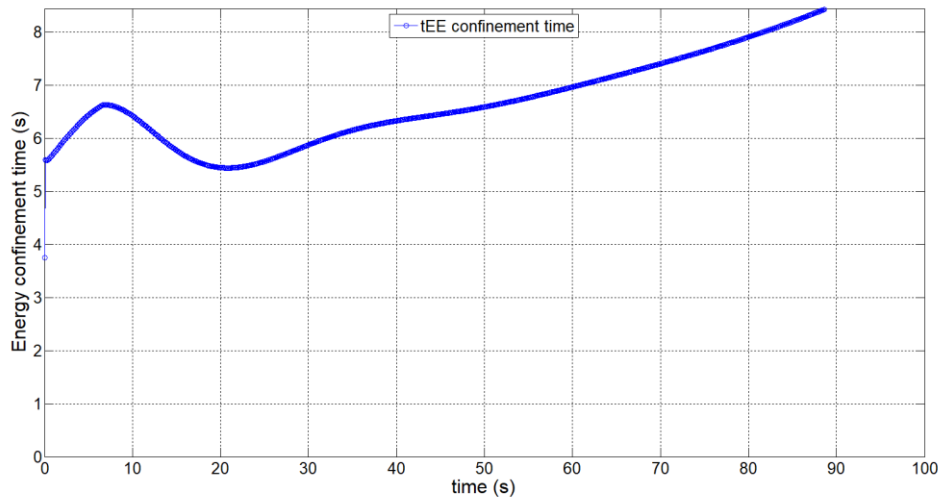


Figure 431: HCLL DEMO2 Auxiliary Heating Cut-off Confinement time graphic.

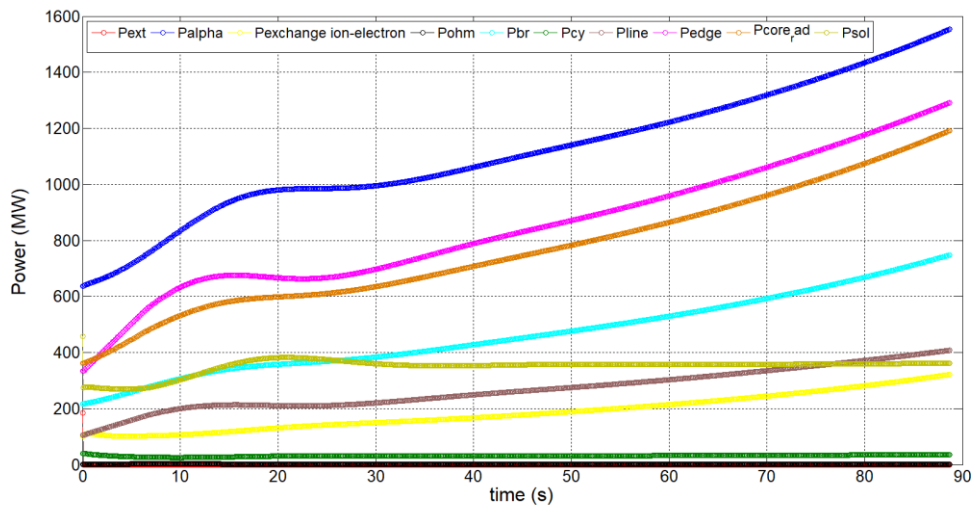


Figure 432: HCLL DEMO2 Auxiliary Heating Cut-off Powers graphic.

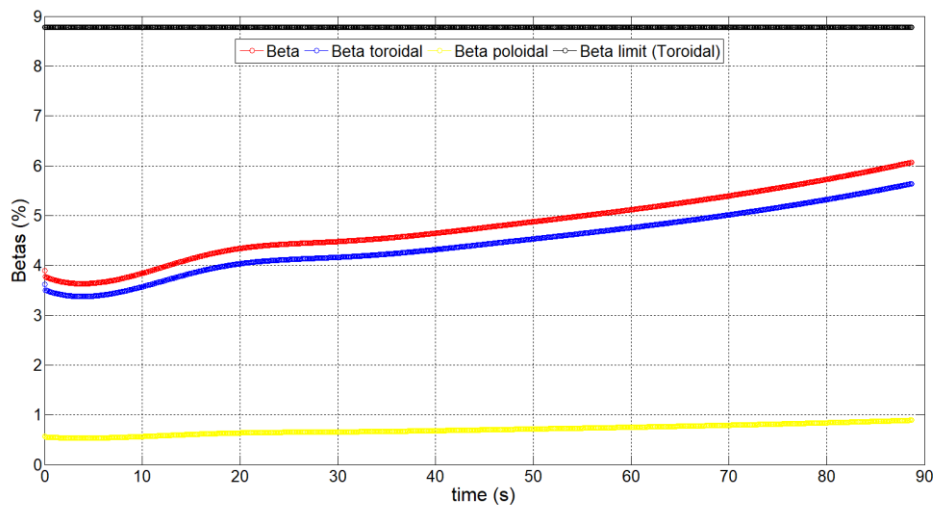


Figure 433: HCLL DEMO2 Auxiliary Heating Cut-off Betas graphic.

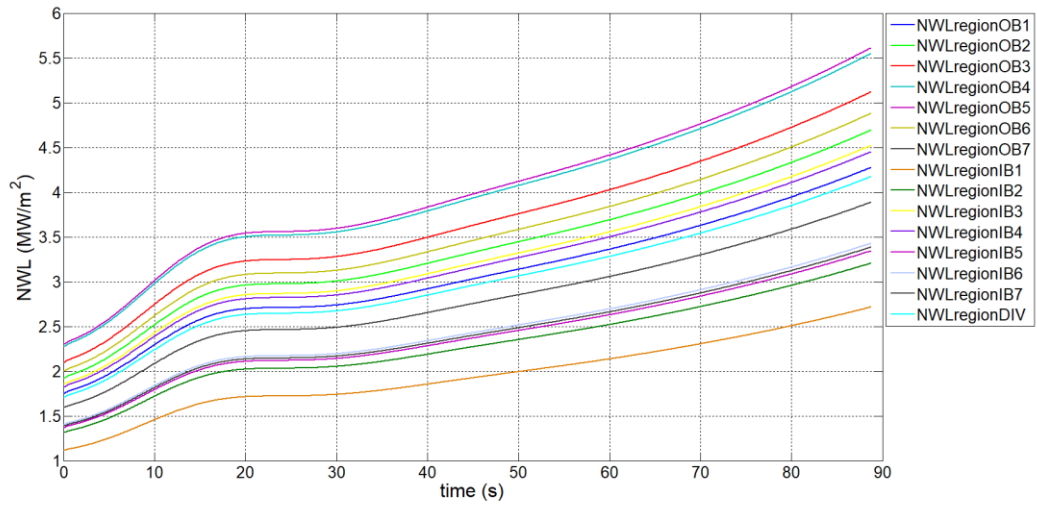


Figure 434: HCLL DEMO2 Auxiliary Heating Cut-off NWL graphic.

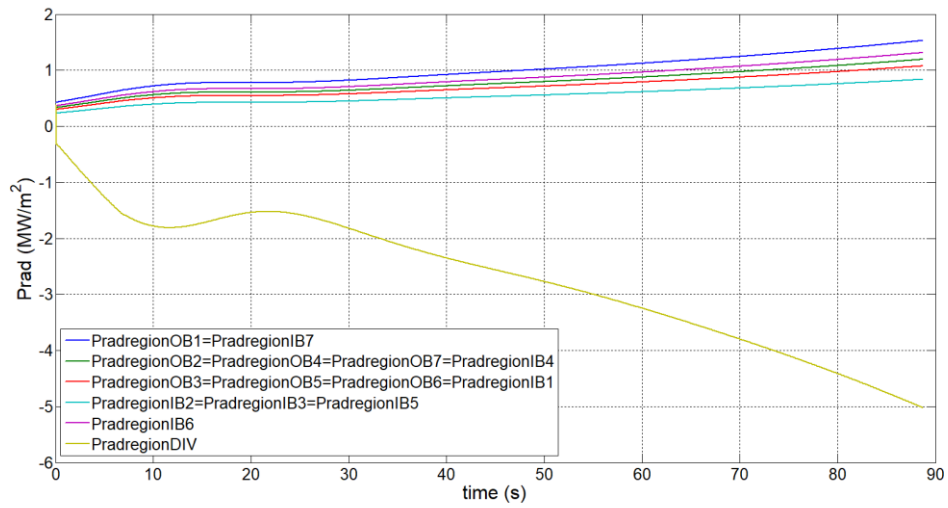


Figure 435: HCLL DEMO2 Auxiliary Heating Cut-off  $P_{rad}$  graphic.

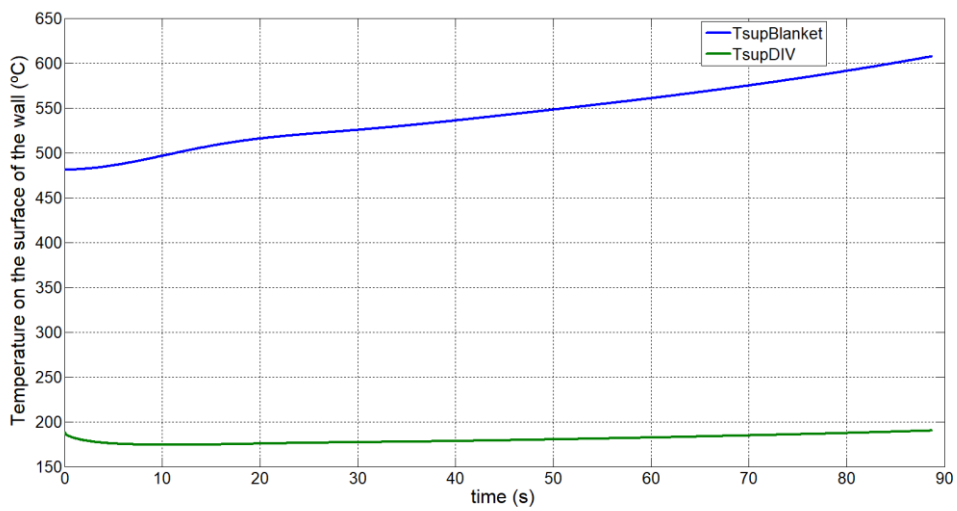


Figure 436: HCLL DEMO2 Auxiliary Heating Cut-off Temperature on the surface of the blanket and divertor wall graphic.

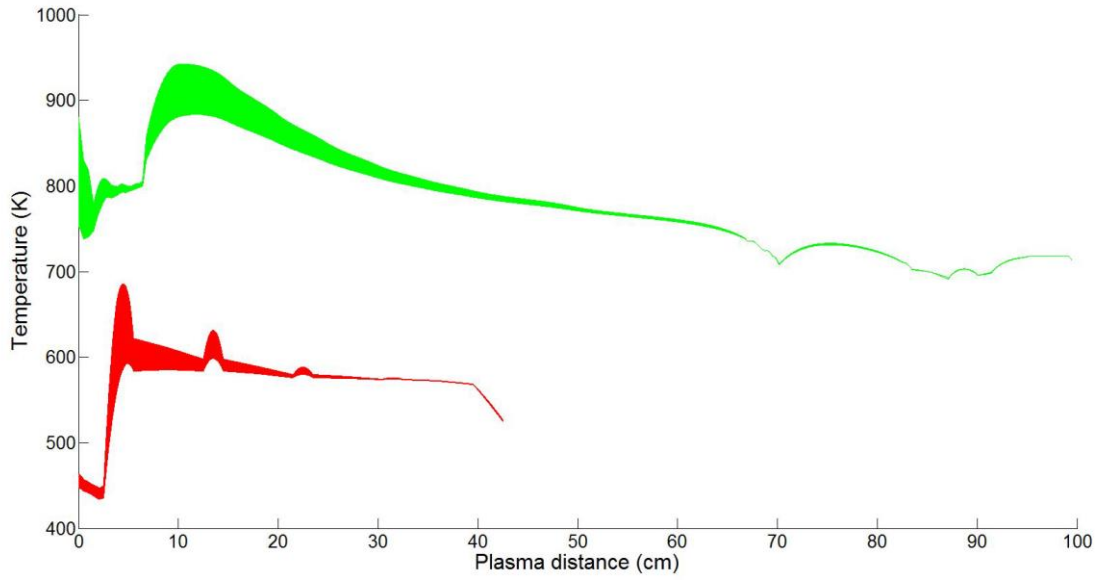


Figure 437: HCLL DEMO2 Auxiliary Heating Cut-off evolution of the BB and divertor temperature graphic.

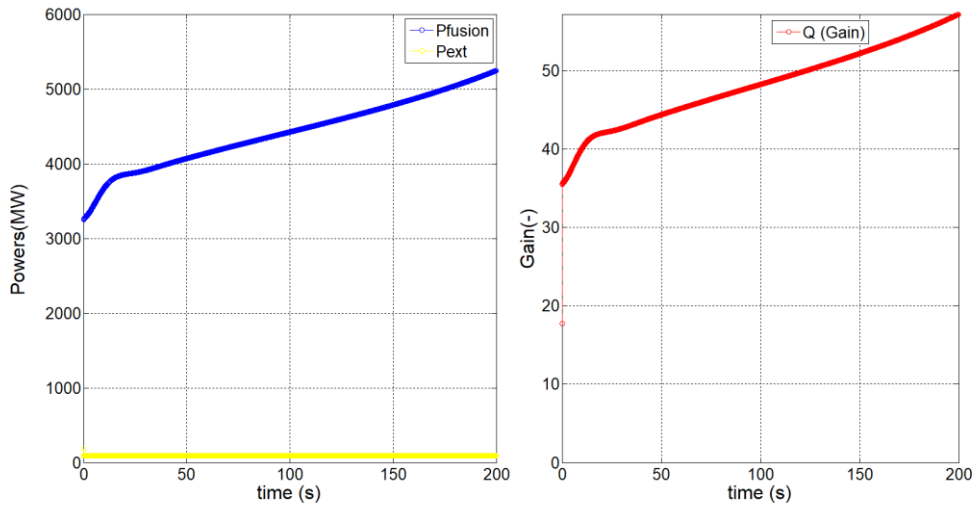


Figure 438: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5  $P_{fus}$  and gain graphic.

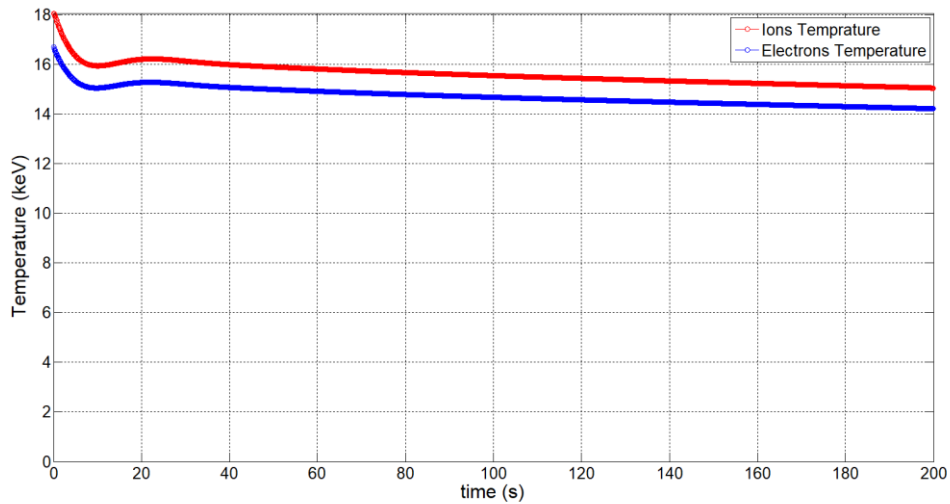


Figure 439: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5 Temperatures graphic.

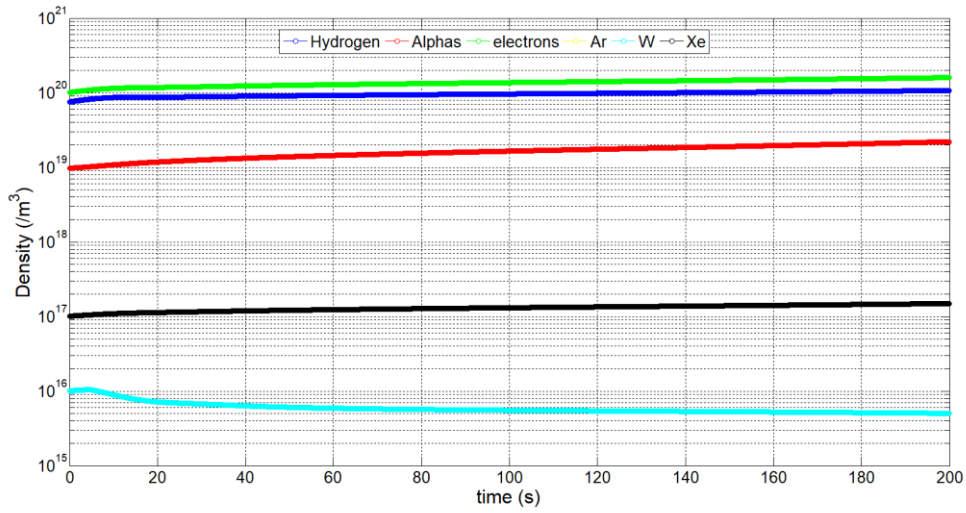


Figure 440: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5 Densities graphic.

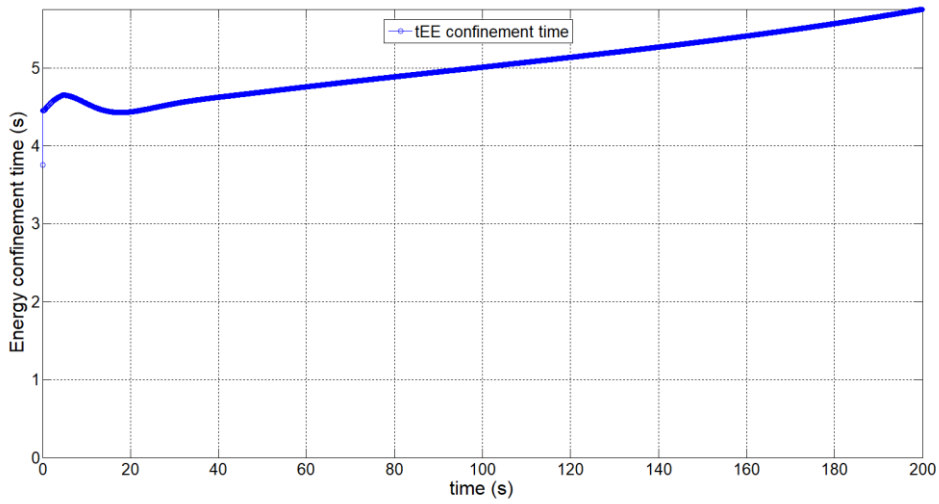


Figure 441: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5 Confinement time graphic.

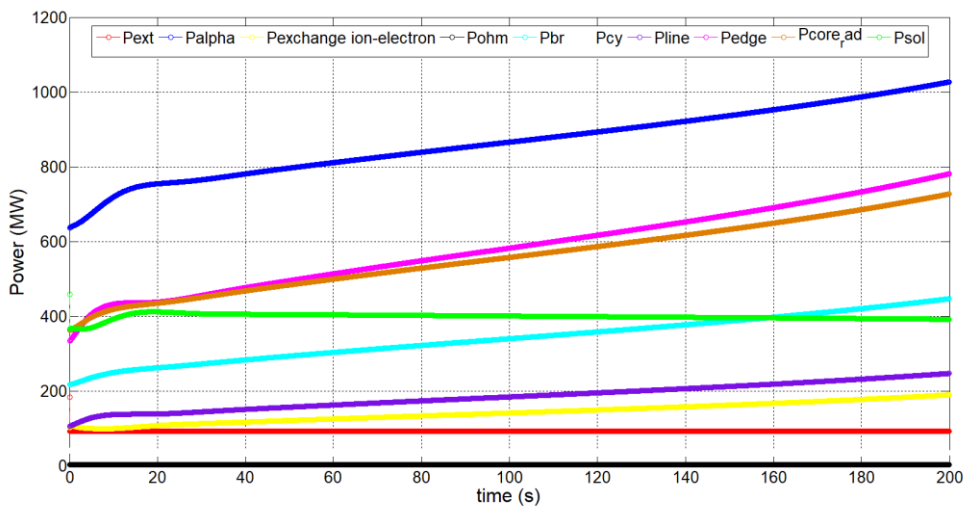


Figure 442: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5 Powers graphic.

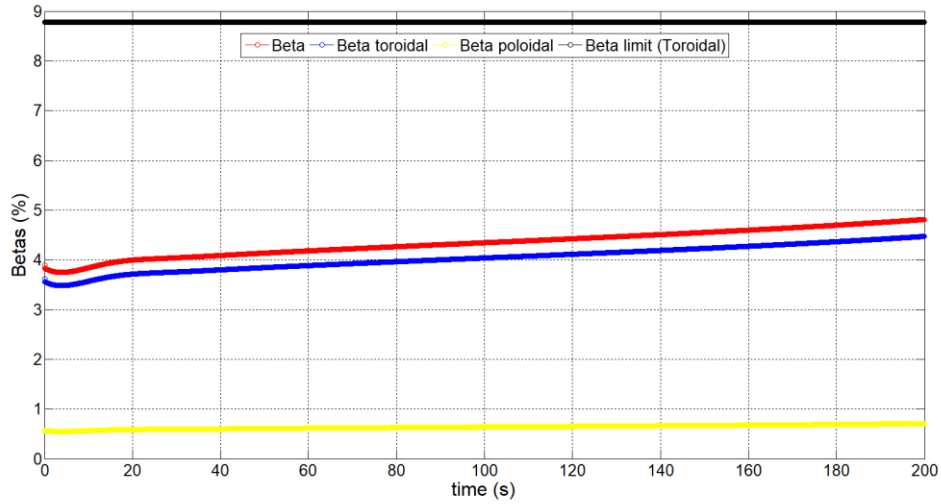


Figure 443: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5 Betas graphic.

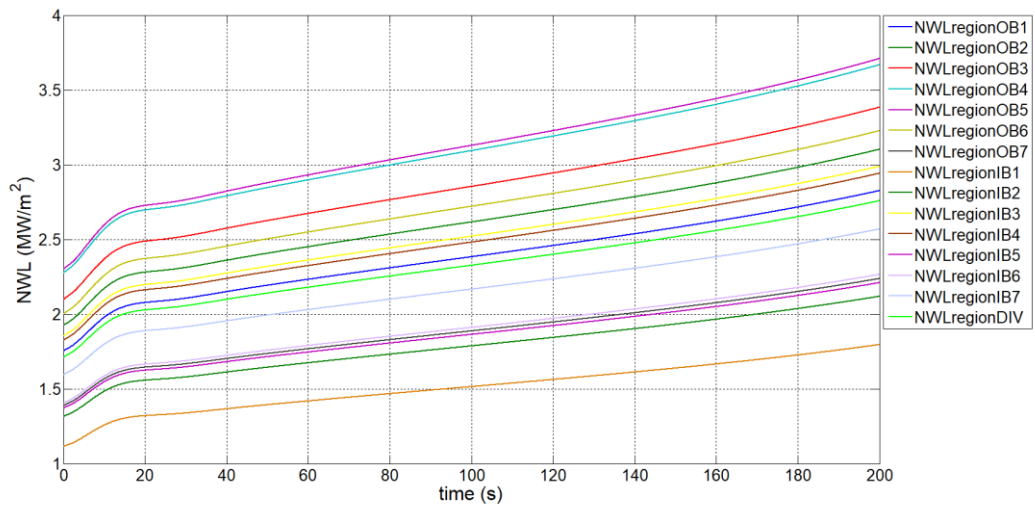


Figure 444: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5 NWL graphic.

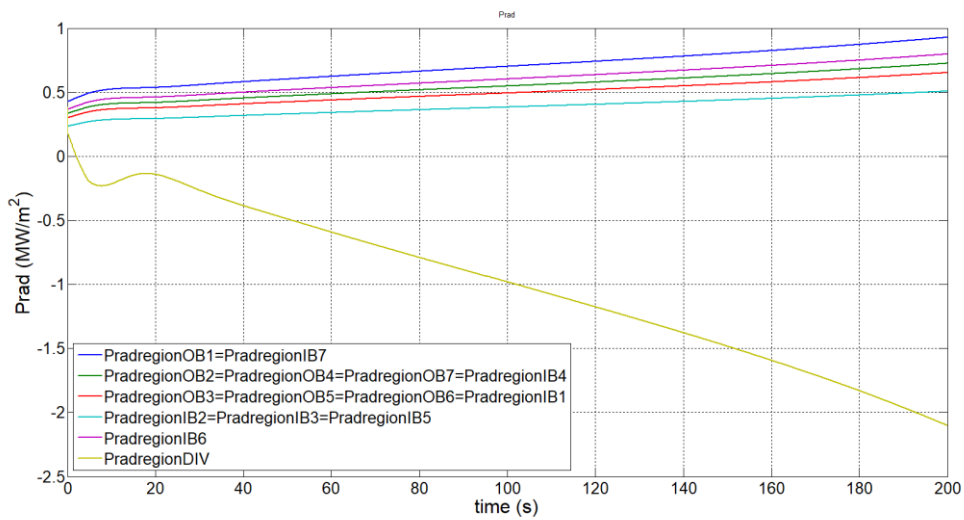


Figure 445: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5  $P_{rad}$  graphic.

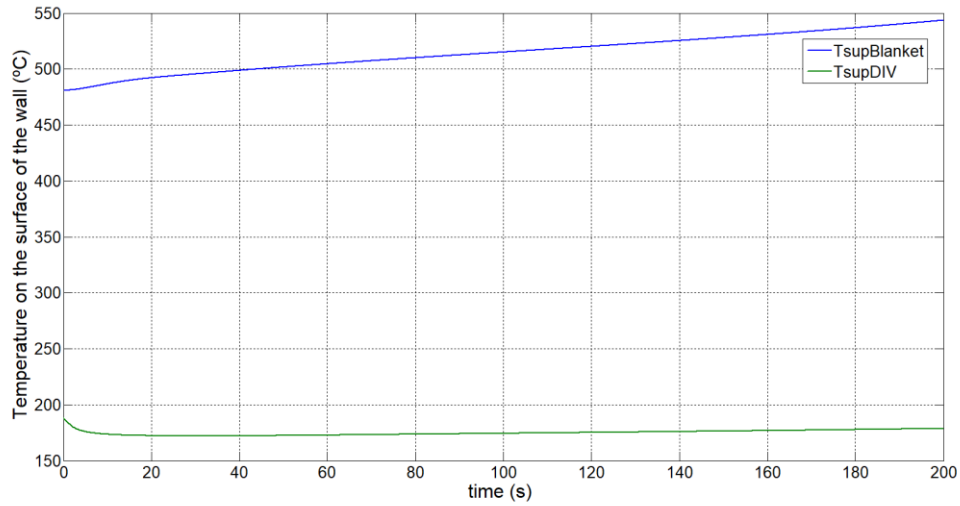


Figure 446: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5 Temperature on the surface of the blanket and divertor wall graphic.

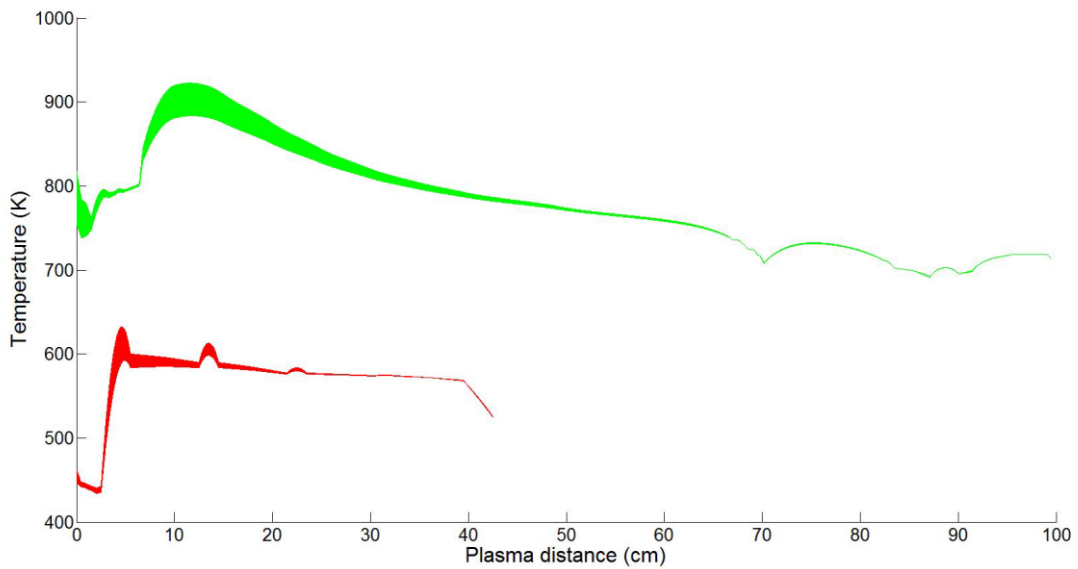


Figure 447: HCLL DEMO2 Auxiliary Heating sudden decrease x0.5 evolution of the BB and divertor temperature graphic.

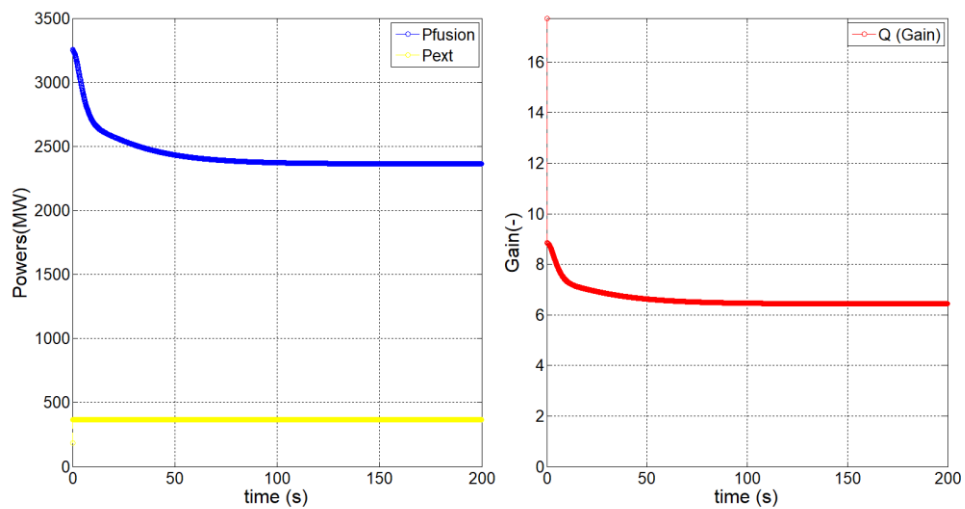


Figure 448: HCLL DEMO2 Auxiliary Heating sudden increase x2  $P_{fus}$  and gain graphic.



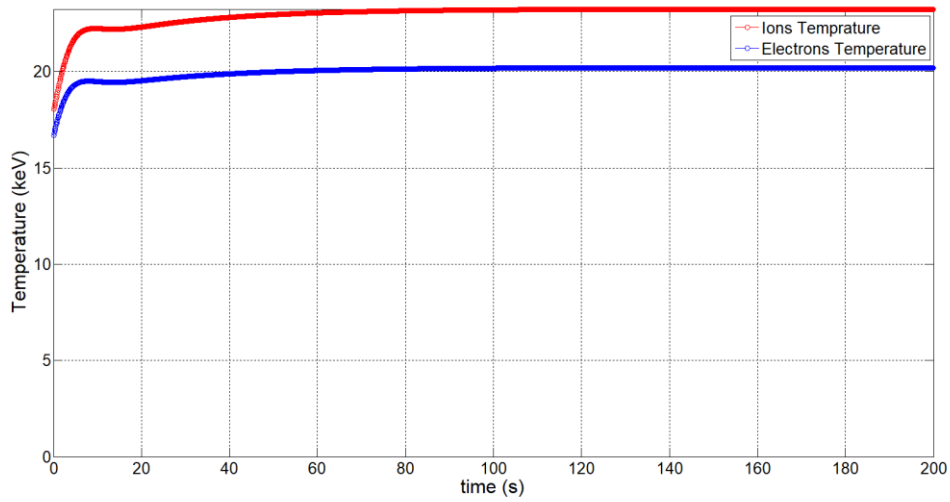


Figure 449: HCLL DEMO2 Auxiliary Heating sudden increase x2 Temperatures graphic.

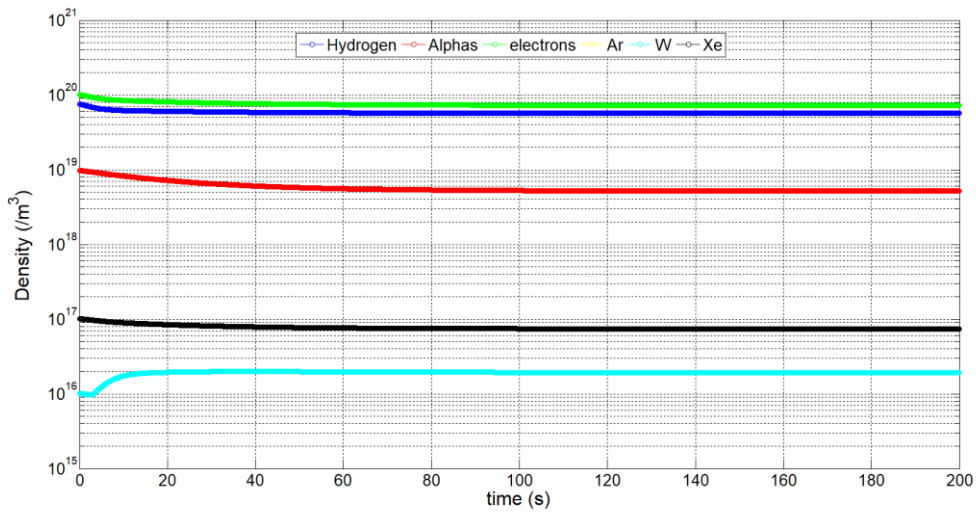


Figure 450: HCLL DEMO2 Auxiliary Heating sudden increase x2 Densities graphic.

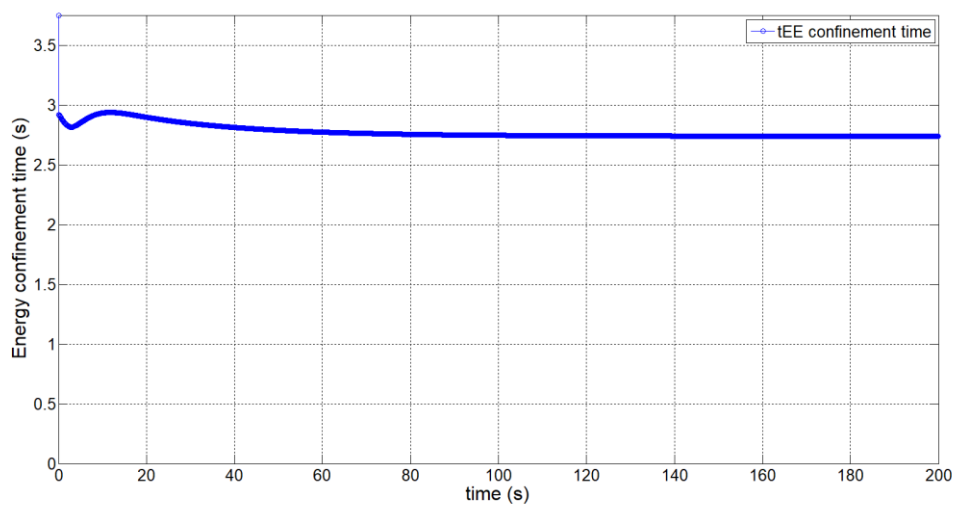


Figure 451: HCLL DEMO2 Auxiliary Heating sudden increase x2 Confinement time graphic.

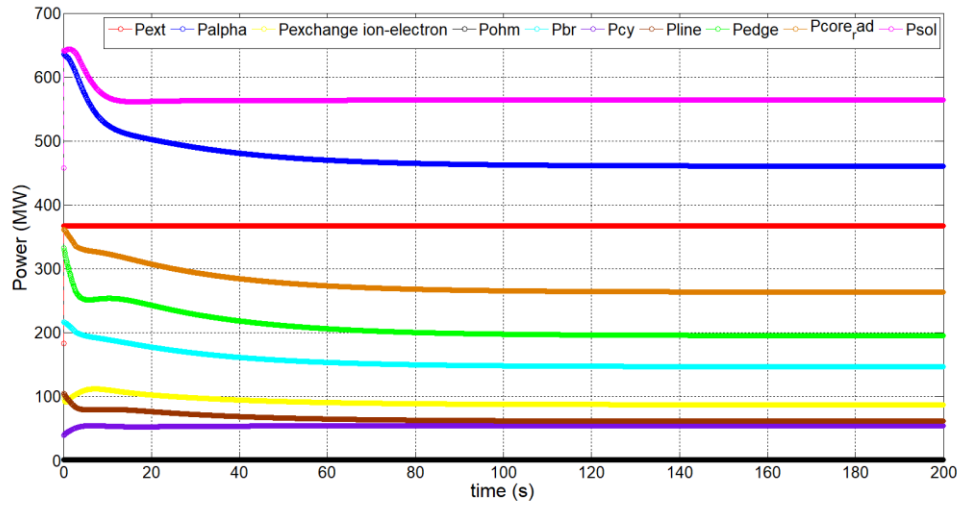


Figure 452: HCLL DEMO2 Auxiliary Heating sudden increase x2 Powers graphic.

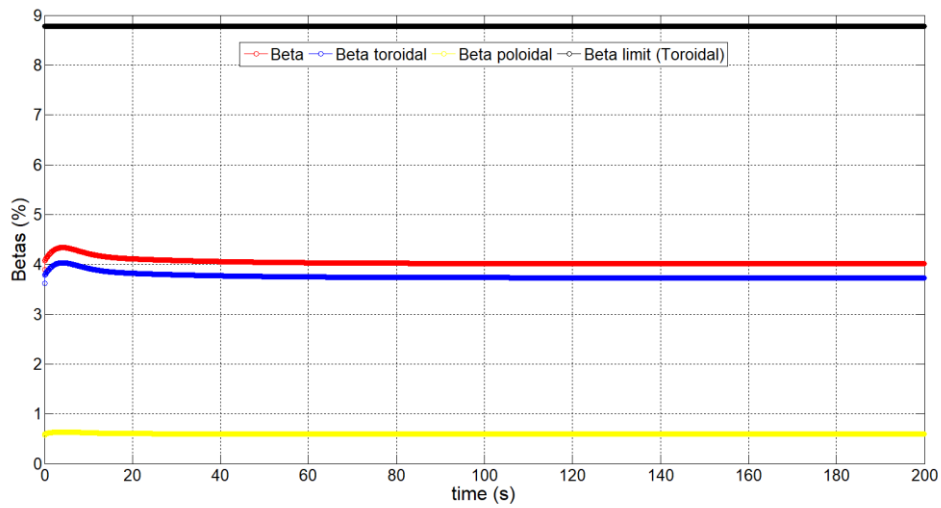


Figure 453: HCLL DEMO2 Auxiliary Heating sudden increase x2 Betas graphic.

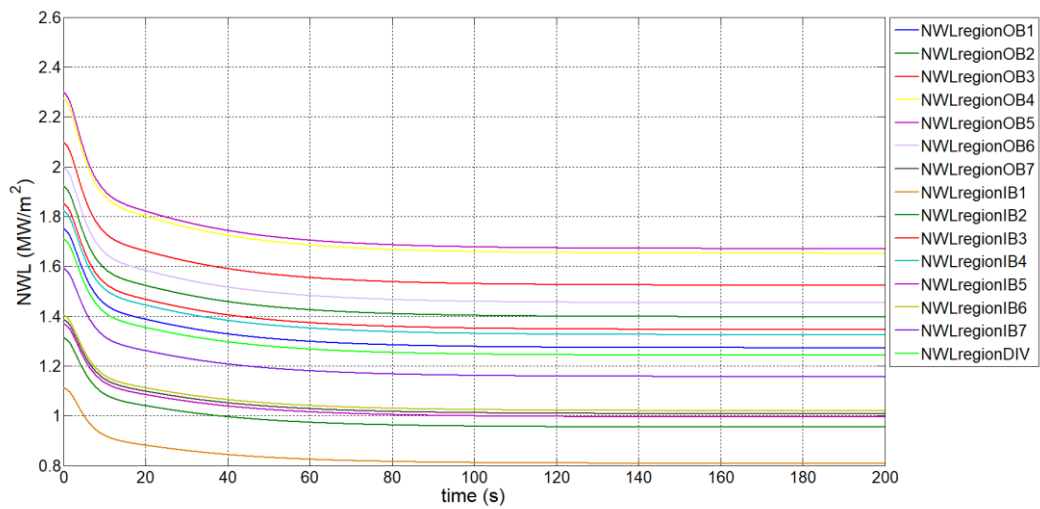


Figure 454: HCLL DEMO2 Auxiliary Heating sudden increase x2 NWL graphic.

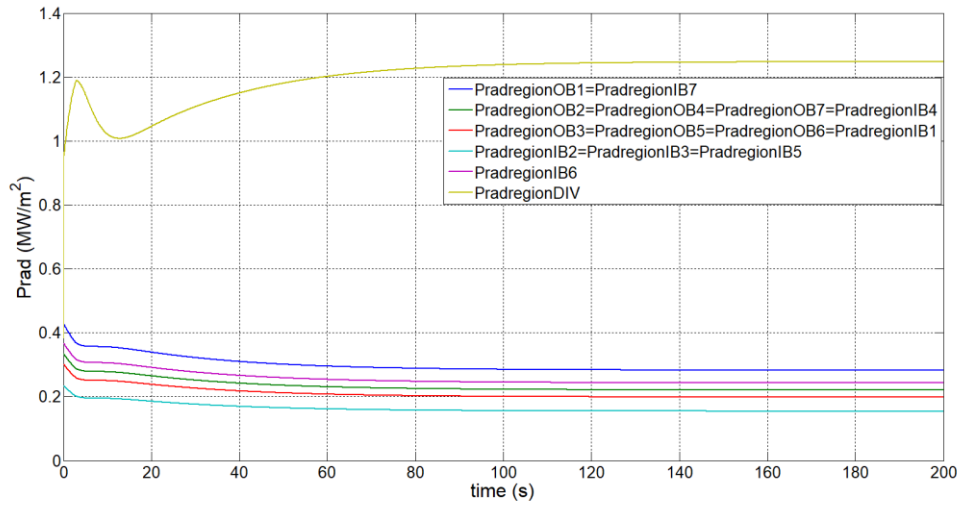


Figure 455: HCLL DEMO2 Auxiliary Heating sudden increase x2  $P_{rad}$  graphic.

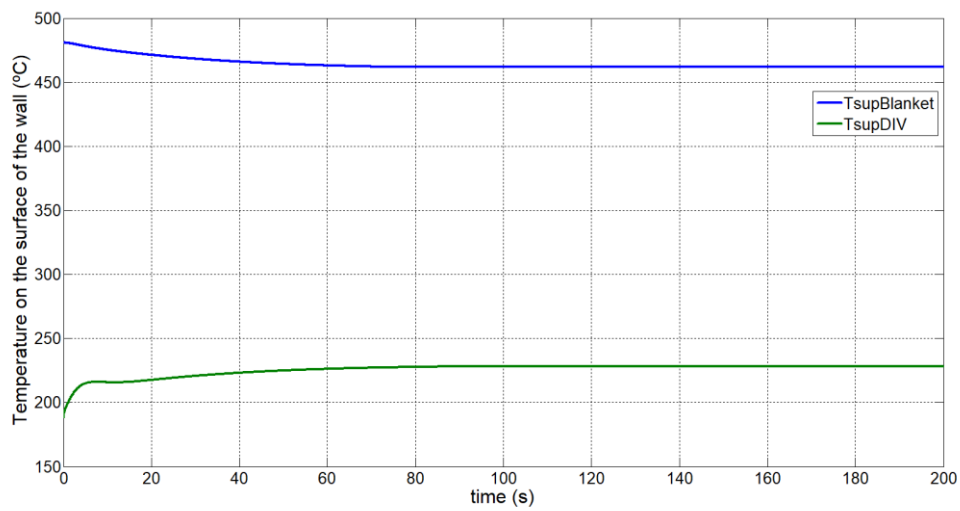


Figure 456: HCLL DEMO2 Auxiliary Heating sudden increase x2 Temperature on the surface of the blanket and divertor wall graphic.

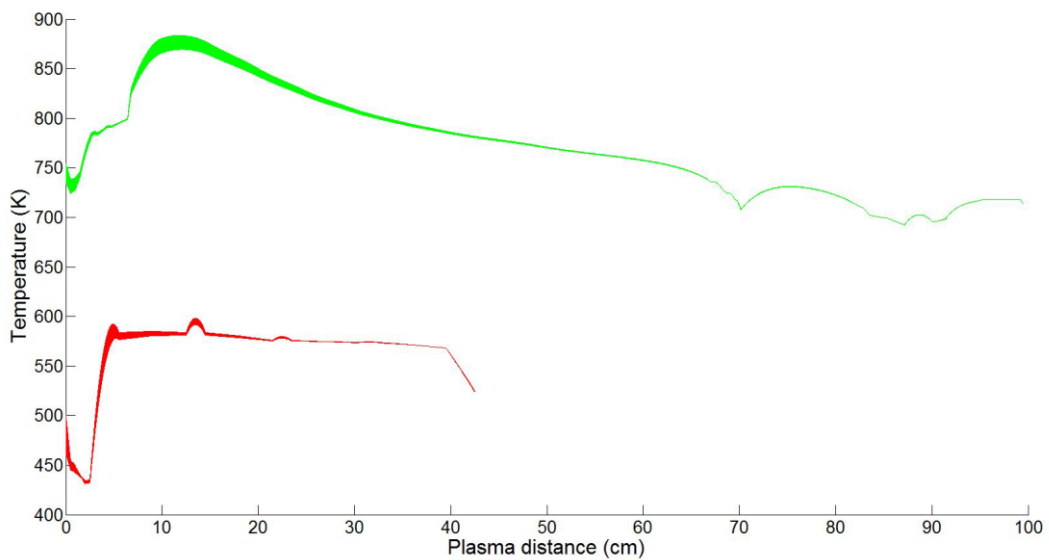


Figure 457: HCLL DEMO2 Auxiliary Heating sudden increase x2 evolution of the BB and divertor temperature graphic.

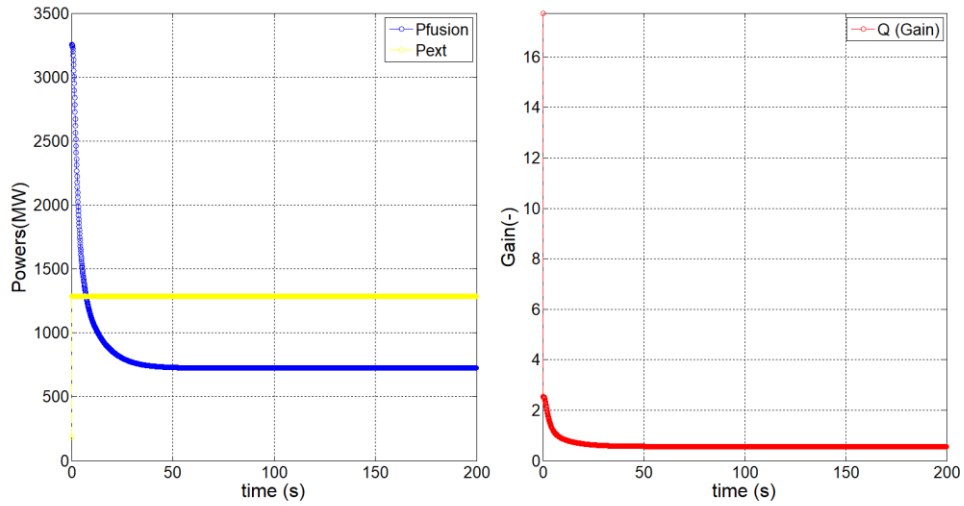


Figure 458: HCLL DEMO2 Auxiliary Heating sudden increase x7  $P_{fus}$  and gain graphic.

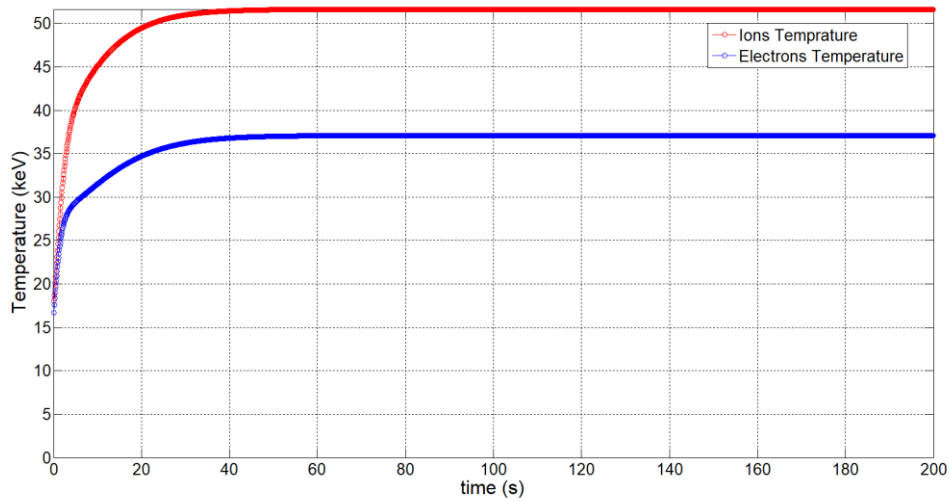


Figure 459: HCLL DEMO2 Auxiliary Heating sudden increase x7 Temperatures graphic.

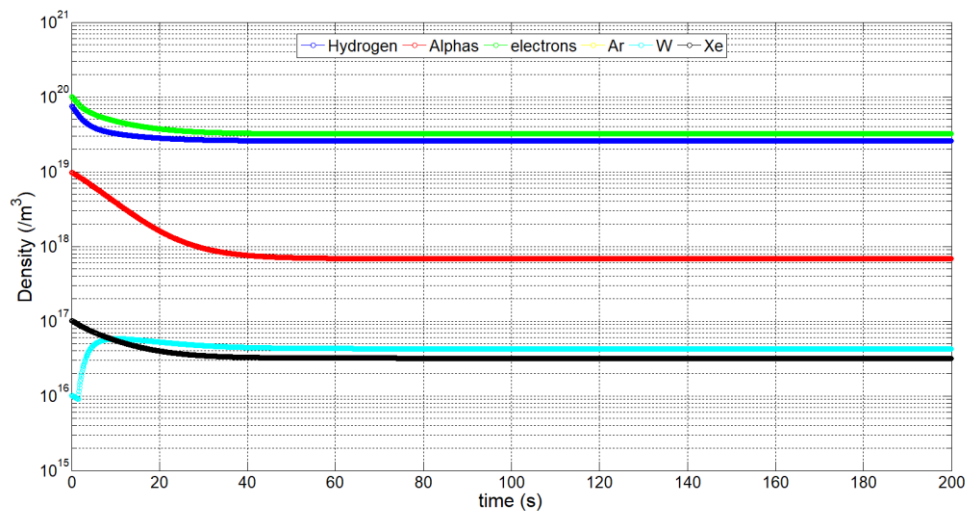


Figure 460: HCLL DEMO2 Auxiliary Heating sudden increase x7 Densities graphic.

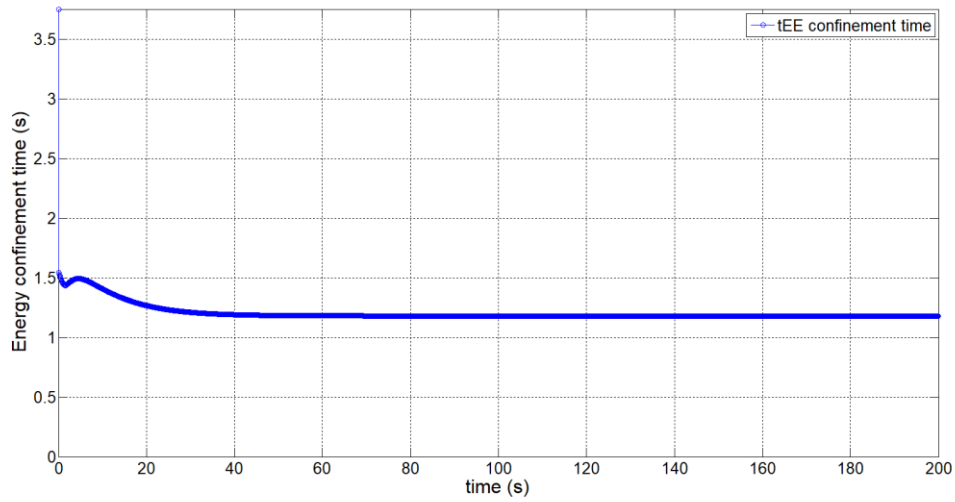


Figure 461: HCLL DEMO2 Auxiliary Heating sudden increase x7 Confinement time graphic.

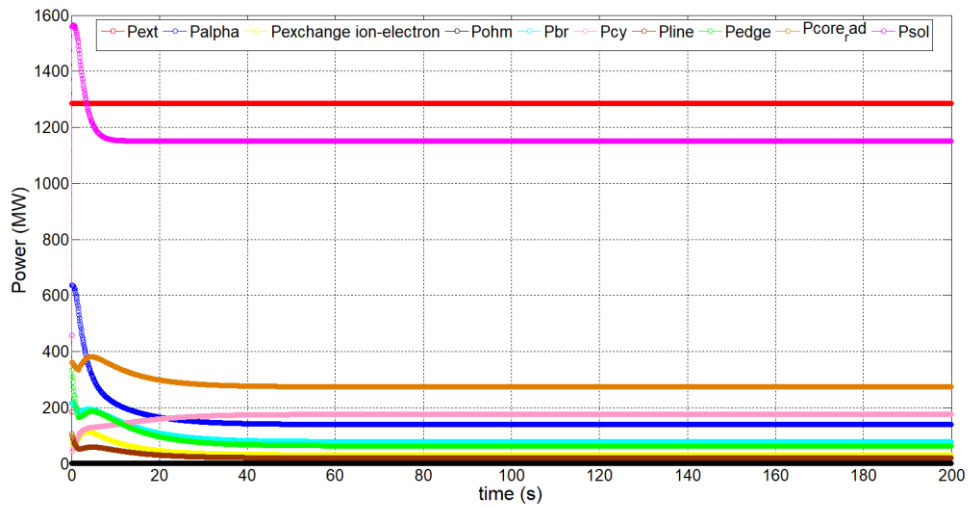


Figure 462: HCLL DEMO2 Auxiliary Heating sudden increase x7 Powers graphic.

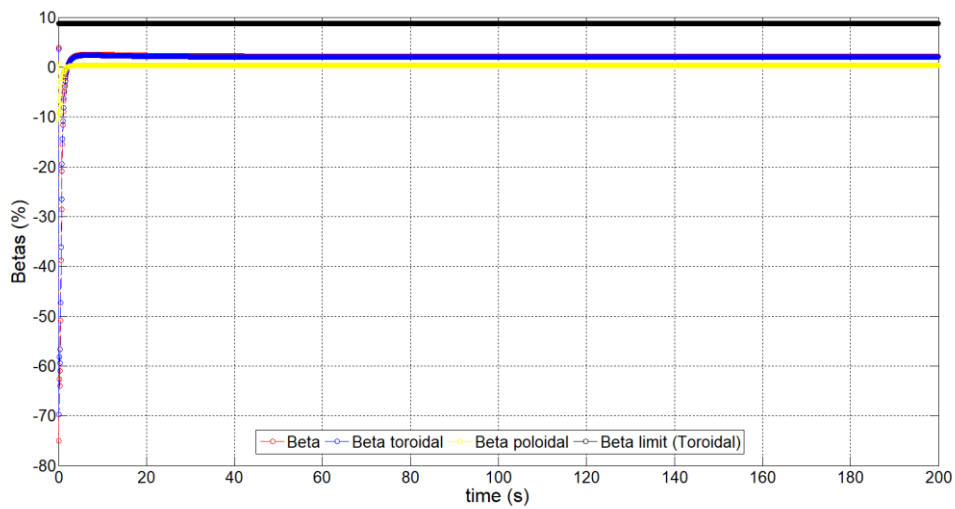


Figure 463: HCLL DEMO2 Auxiliary Heating sudden increase x7 Betas graphic.

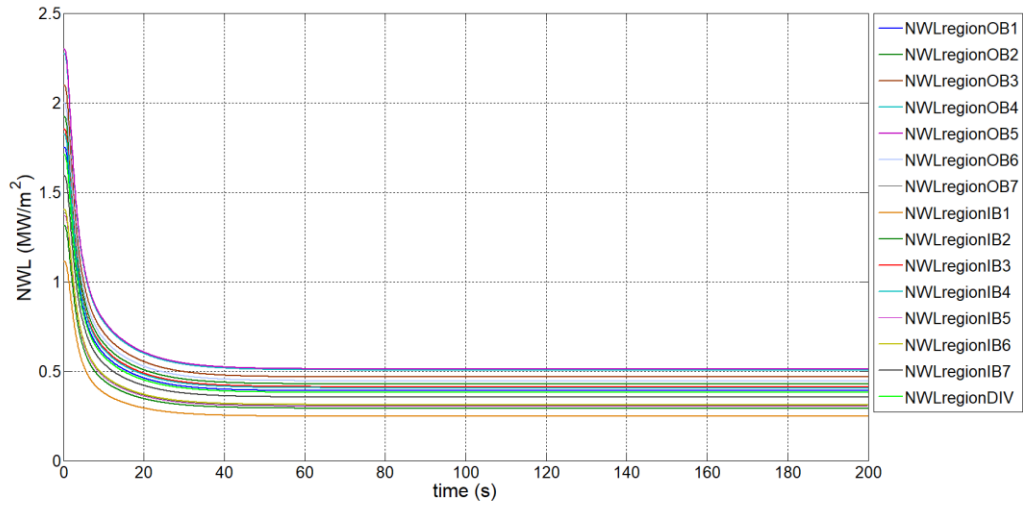


Figure 464: HCLL DEMO2 Auxiliary Heating sudden increase x7 NWL graphic.

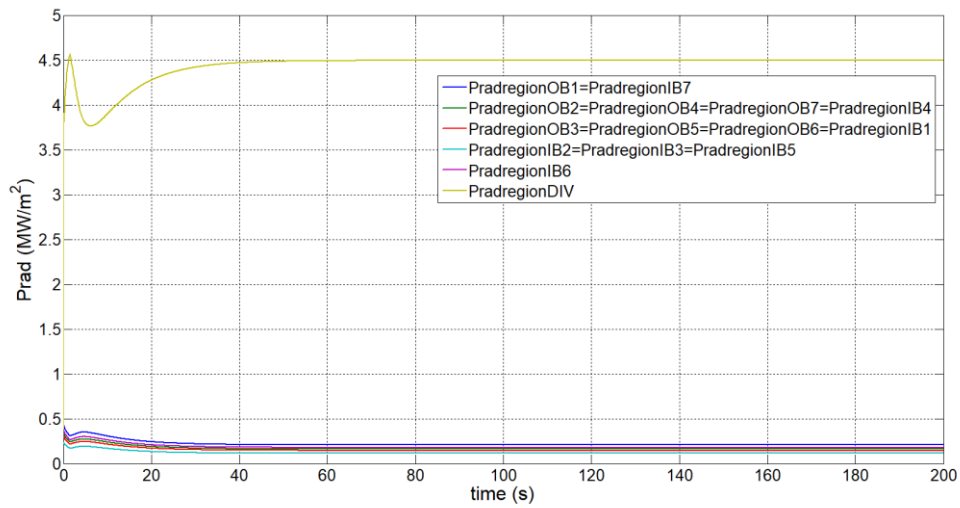


Figure 465: HCLL DEMO2 Auxiliary Heating sudden increase x7  $P_{rad}$  graphic.

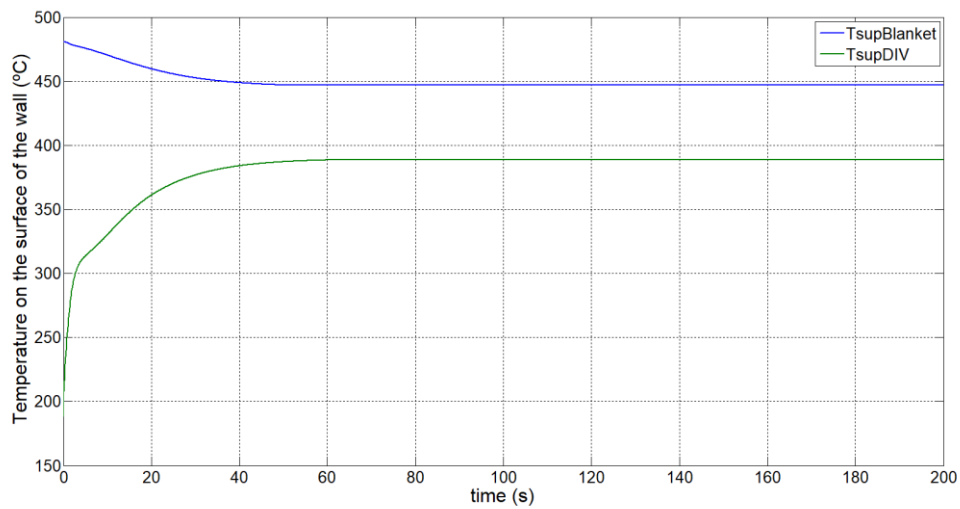


Figure 466: HCLL DEMO2 Auxiliary Heating sudden increase x7 Temperature on the surface of the blanket and divertor wall graphic.

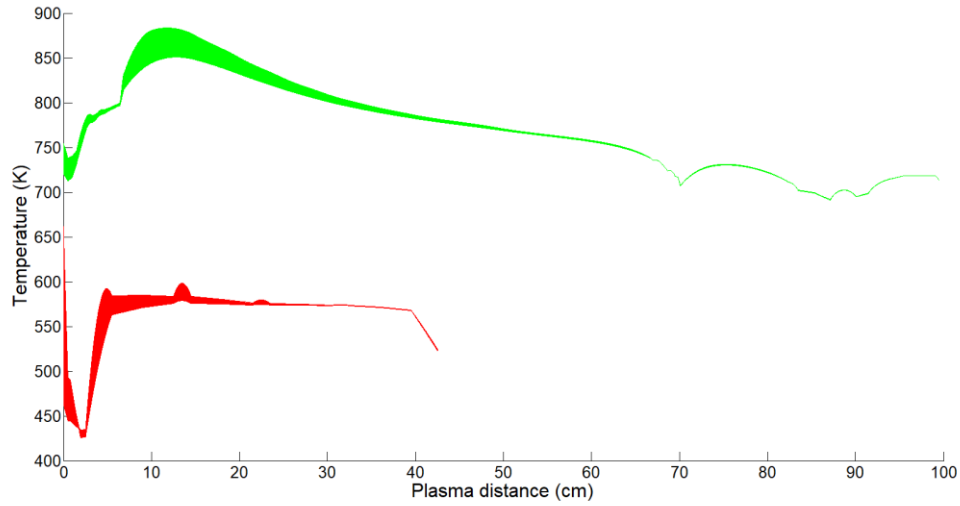


Figure 467: HCLL DEMO2 Auxiliary Heating sudden increase x7 evolution of the BB and divertor temperature graphic.

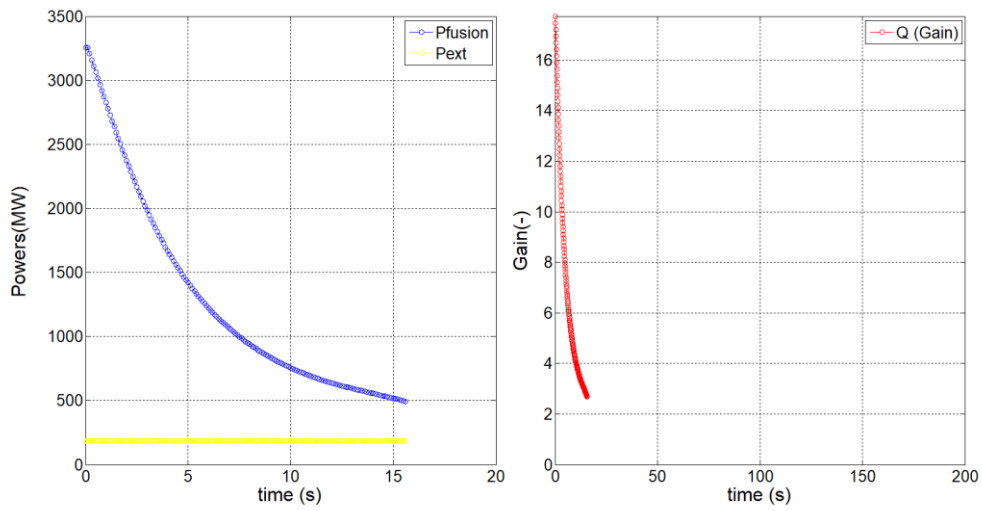


Figure 468: HCLL DEMO2 Fueling Rate Cut-off  $P_{fus}$  and gain graphic.

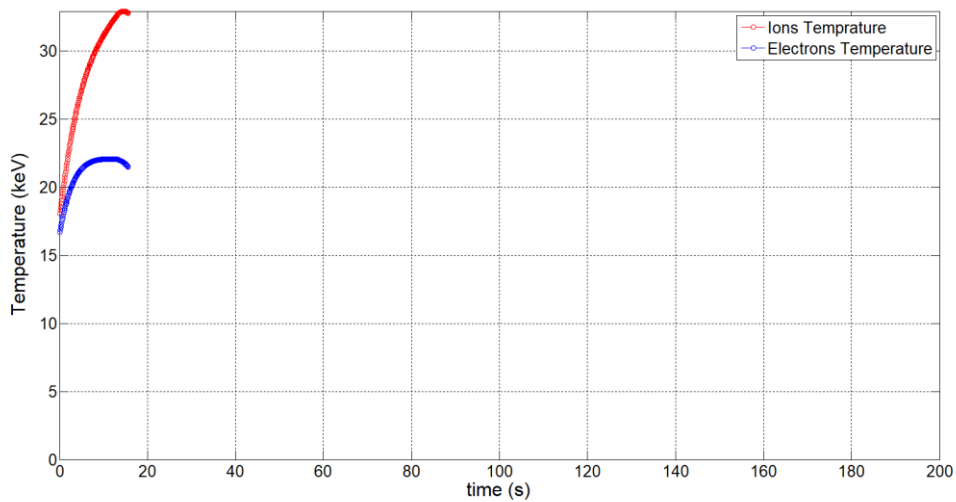


Figure 469: HCLL DEMO2 Fueling Rate Cut-off Temperatures graphic.

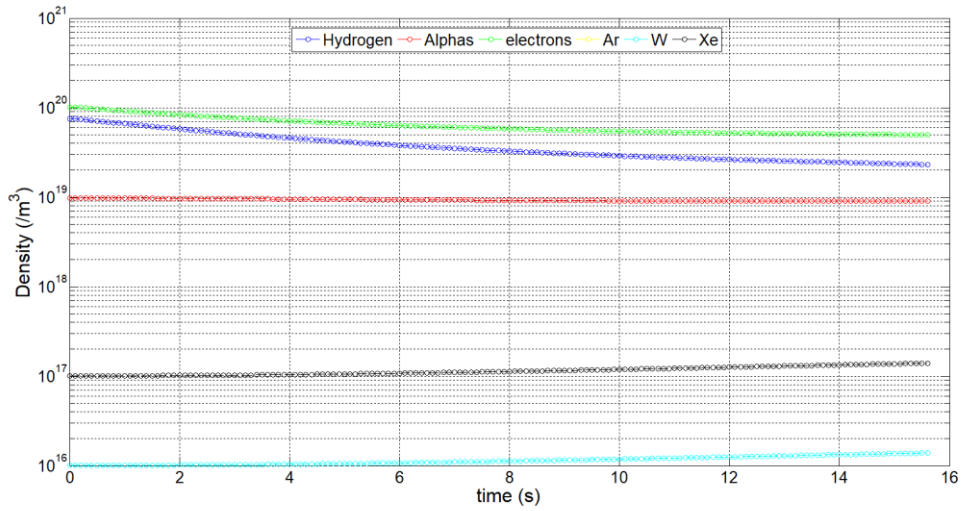


Figure 470: HCLL DEMO2 Fueling Rate Cut-off Densities graphic.

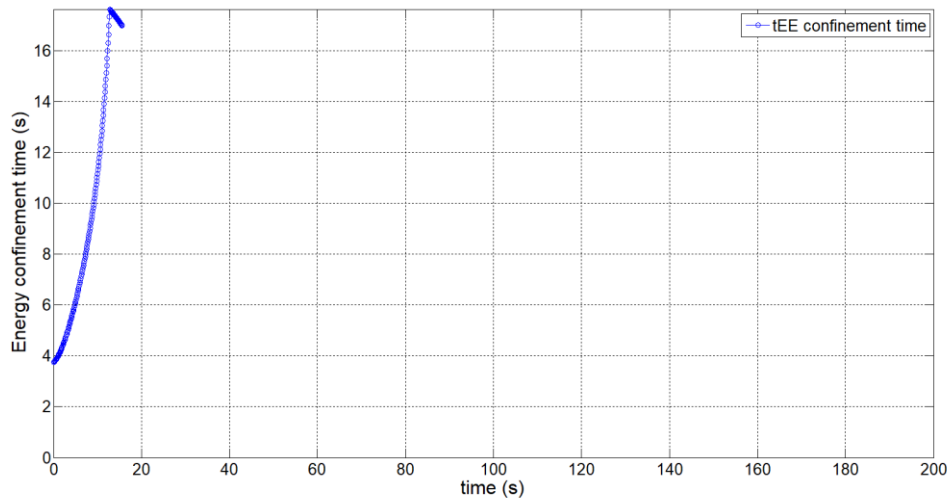


Figure 471: HCLL DEMO2 Fueling Rate Cut-off Confinement time graphic.

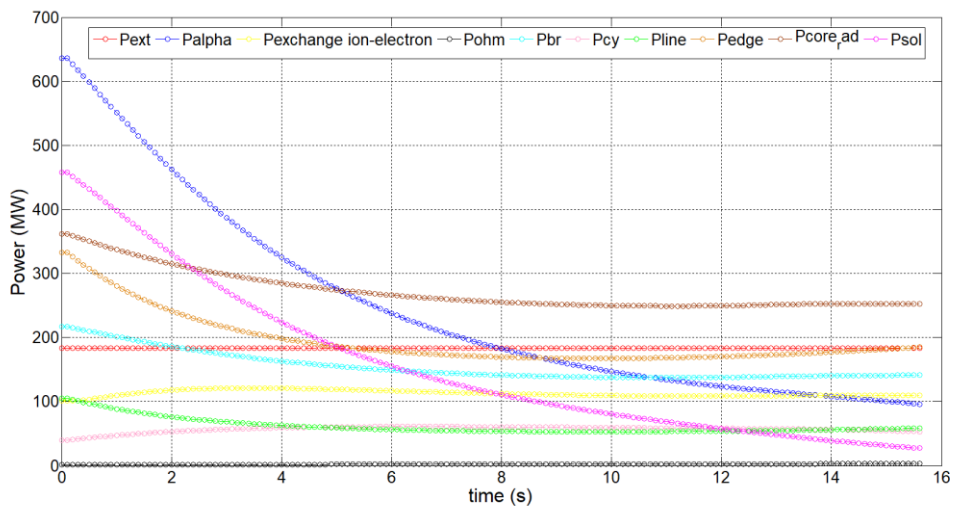


Figure 472: HCLL DEMO2 Fueling Rate Cut-off Powers graphic.



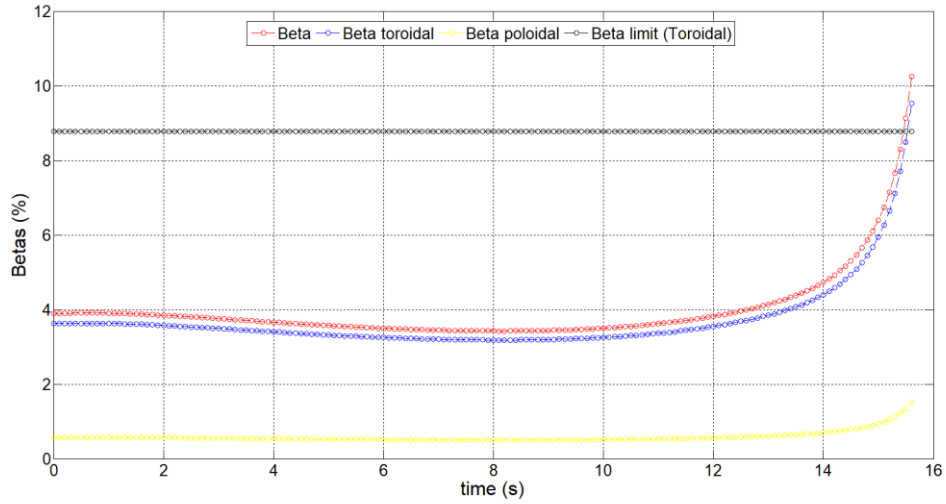


Figure 473: HCLL DEMO2 Fueling Rate Cut-off Betas graphic.

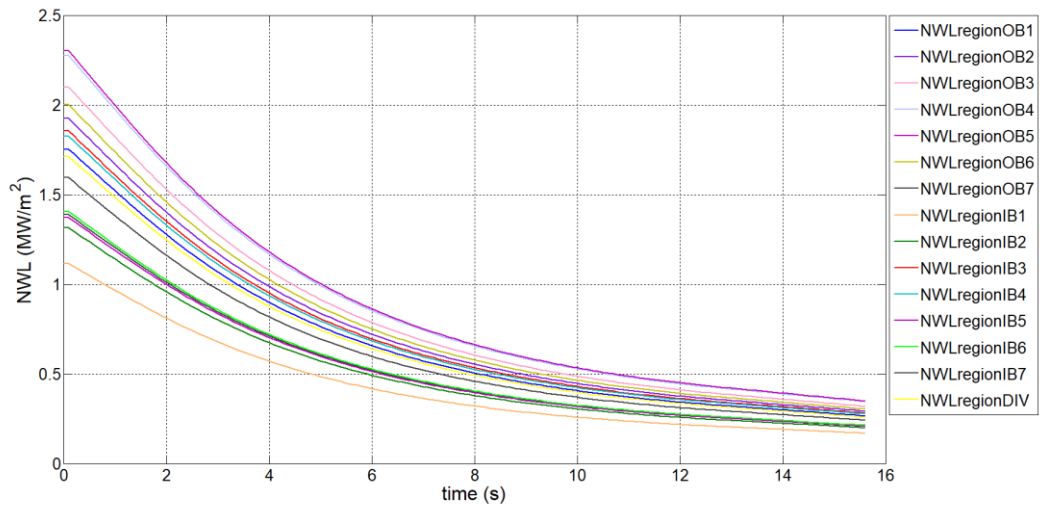


Figure 474: HCLL DEMO2 Fueling Rate Cut-off NWL graphic.

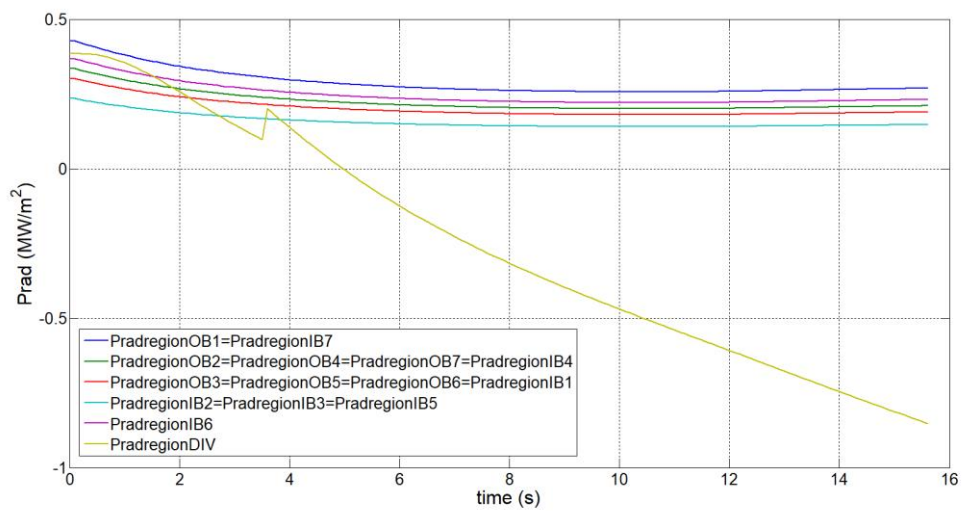


Figure 475: HCLL DEMO2 Fueling Rate Cut-off  $P_{rad}$  graphic.

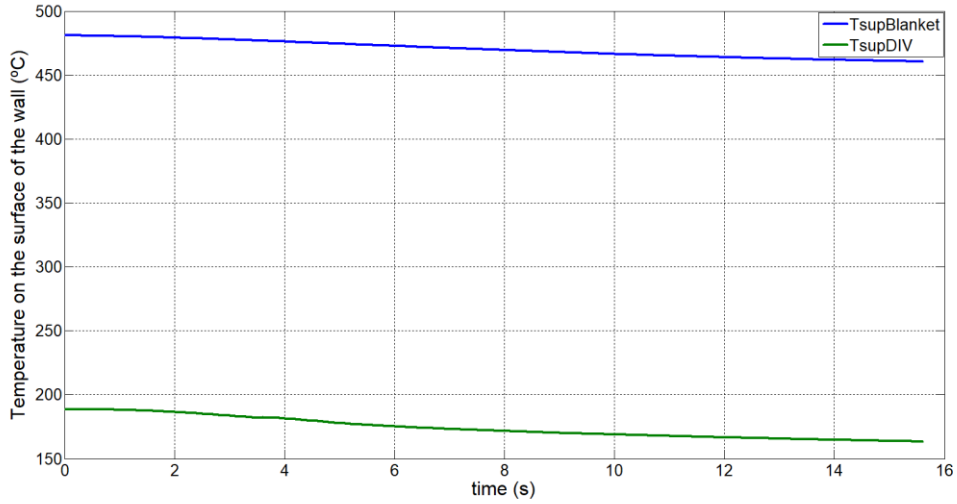


Figure 476: HCLL DEMO2 Fueling Rate Cut-off Temperature on the surface of the blanket and divertor wall graphic.

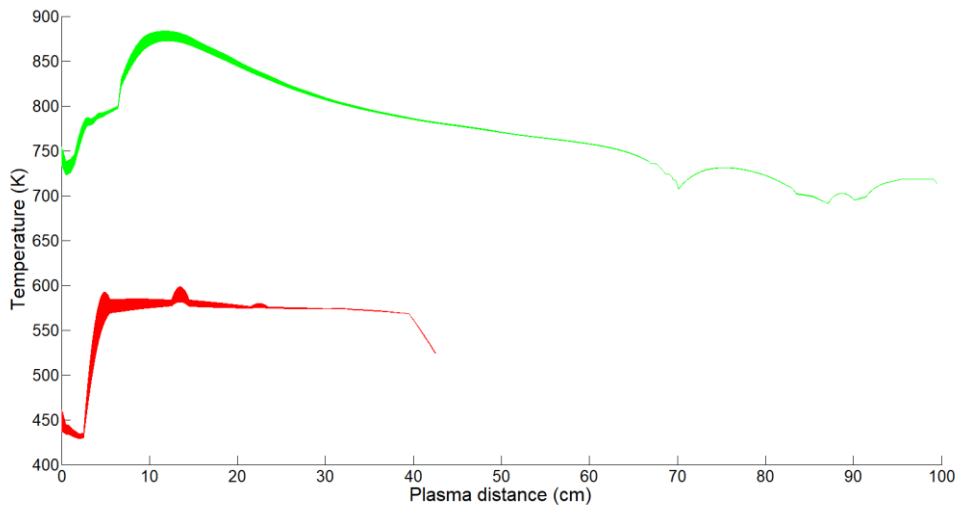


Figure 477: HCLL DEMO2 Fueling Rate Cut-off evolution of the BB and divertor temperature graphic.

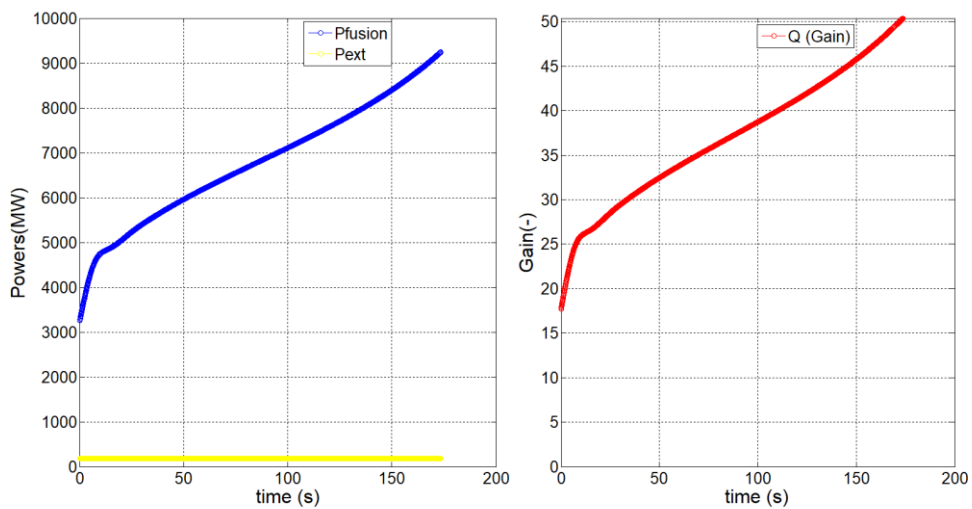


Figure 478: HCLL DEMO2 Fueling Rate sudden increase x1.5 P<sub>fus</sub> and gain graphic.

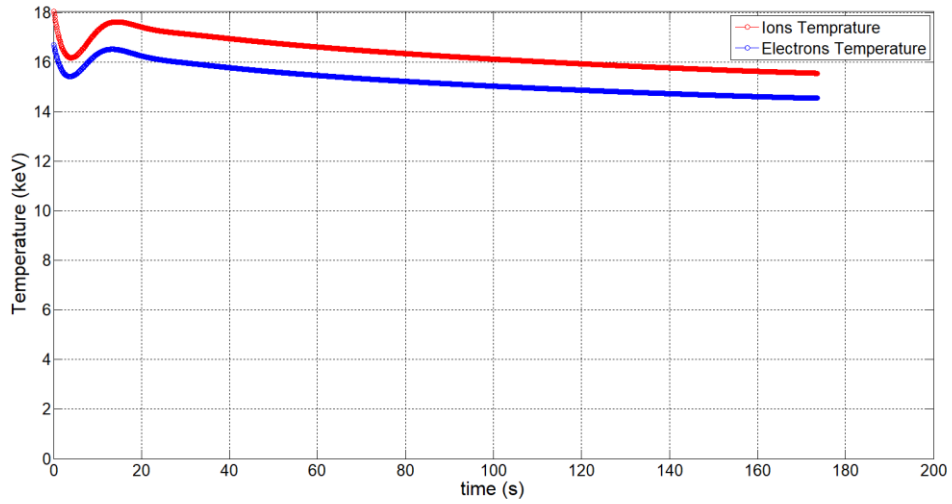


Figure 479: HCLL DEMO2 Fueling Rate sudden increase x1.5 Temperatures graphic.

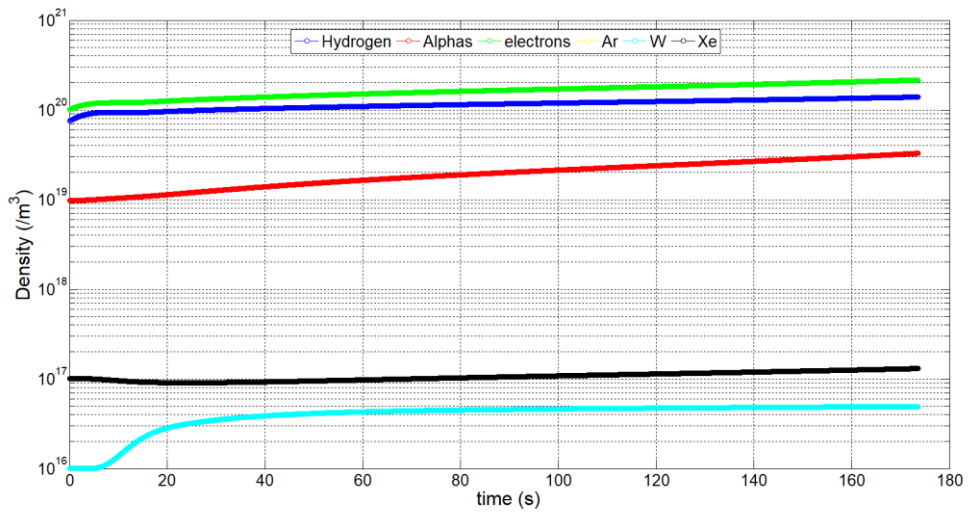


Figure 480: HCLL DEMO2 Fueling Rate sudden increase x1.5 Densities graphic.

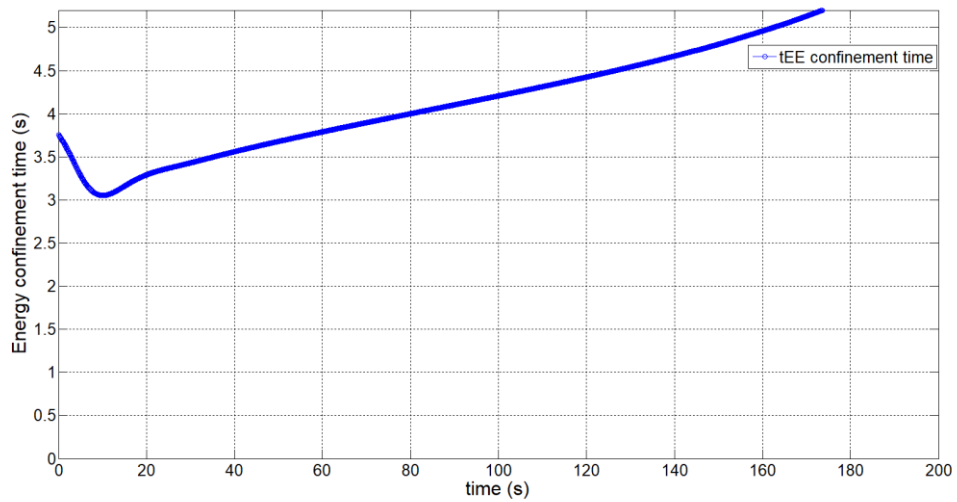


Figure 481: HCLL DEMO2 Fueling Rate sudden increase x1.5 Confinement time graphic.

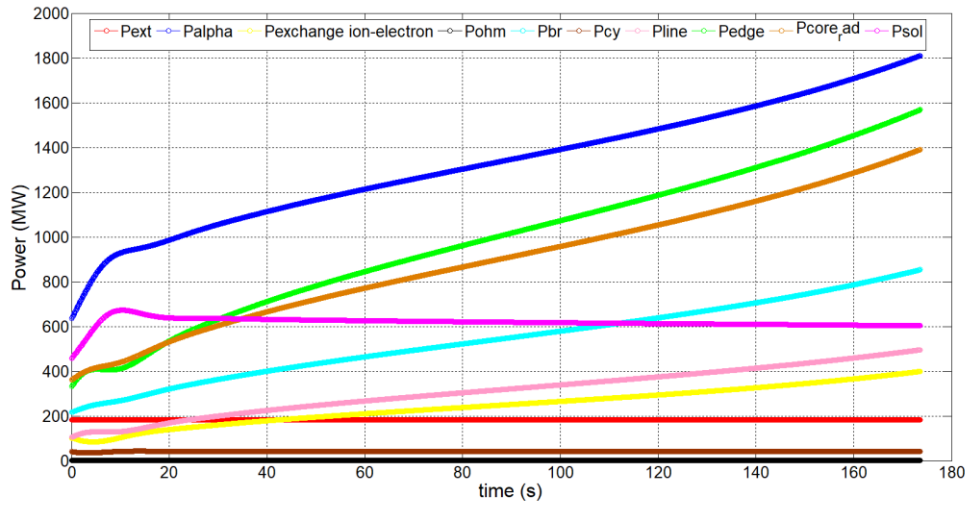


Figure 482: HCLL DEMO2 Fueling Rate sudden increase x1.5 Powers graphic.

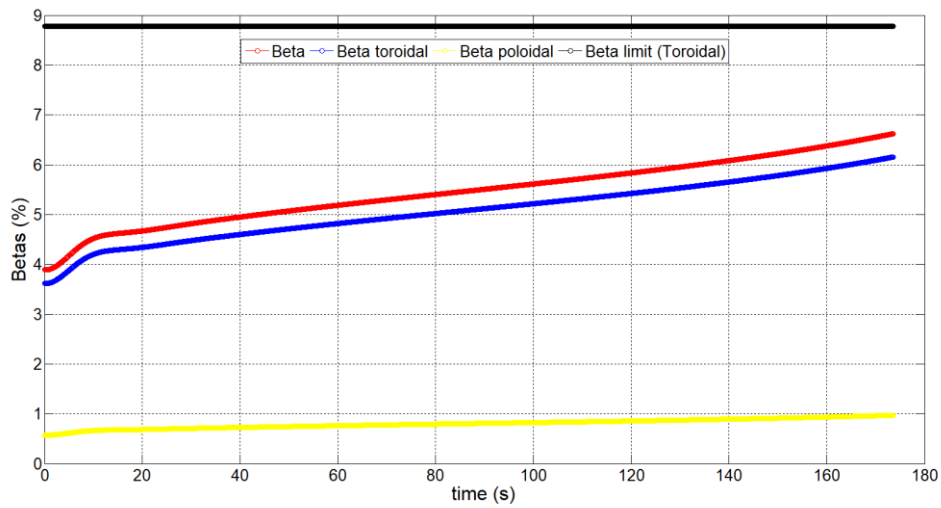


Figure 483: HCLL DEMO2 Fueling Rate sudden increase x1.5 Betas graphic.

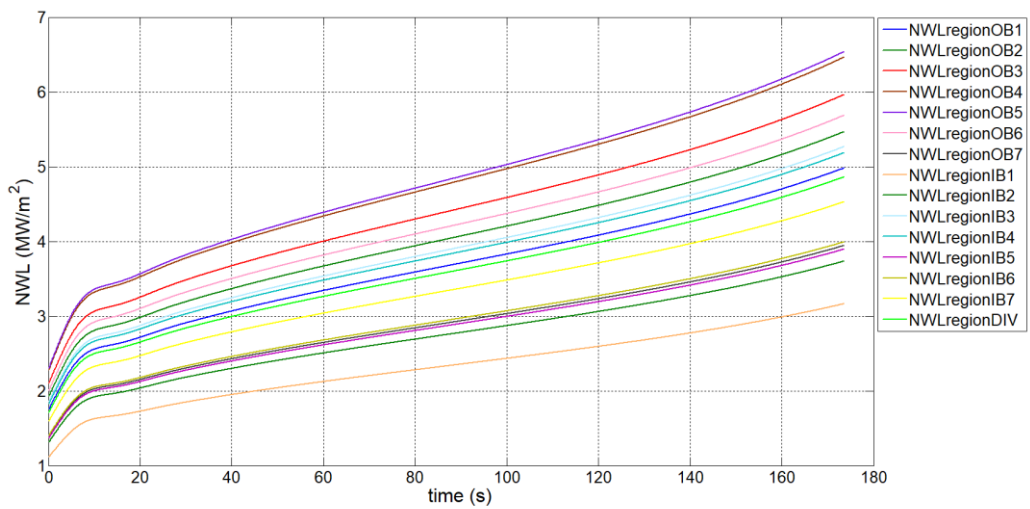


Figure 484: HCLL DEMO2 Fueling Rate sudden increase x1.5 NWL graphic.

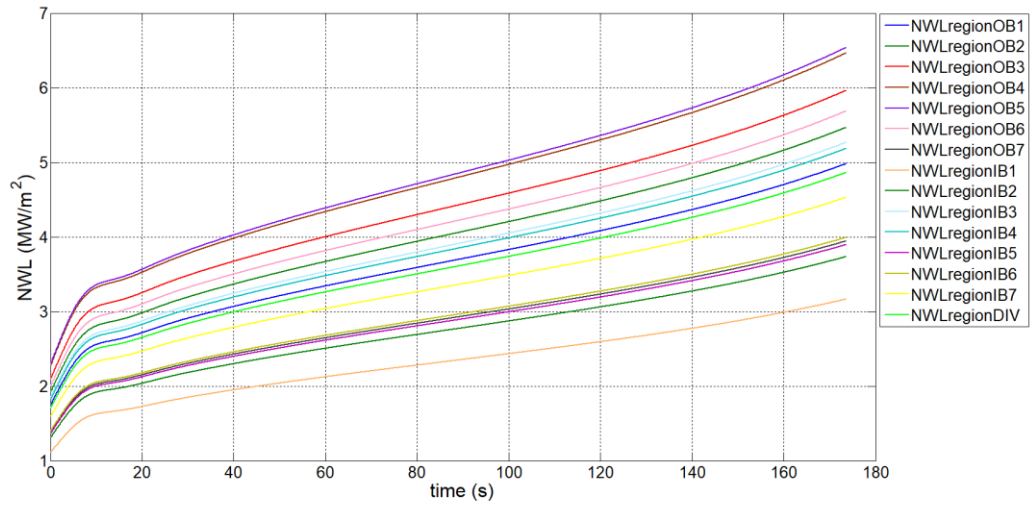


Figure 485: HCLL DEMO2 Fueling Rate sudden increase x1.5  $P_{rad}$  graphic.

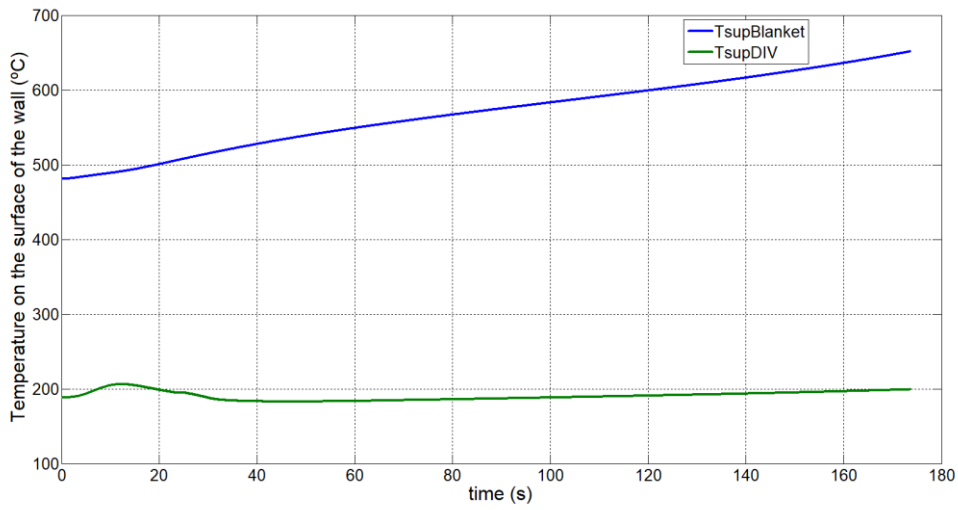


Figure 486: HCLL DEMO2 Fueling Rate sudden increase x1.5 Temperature on the surface of the blanket and divertor wall graphic.

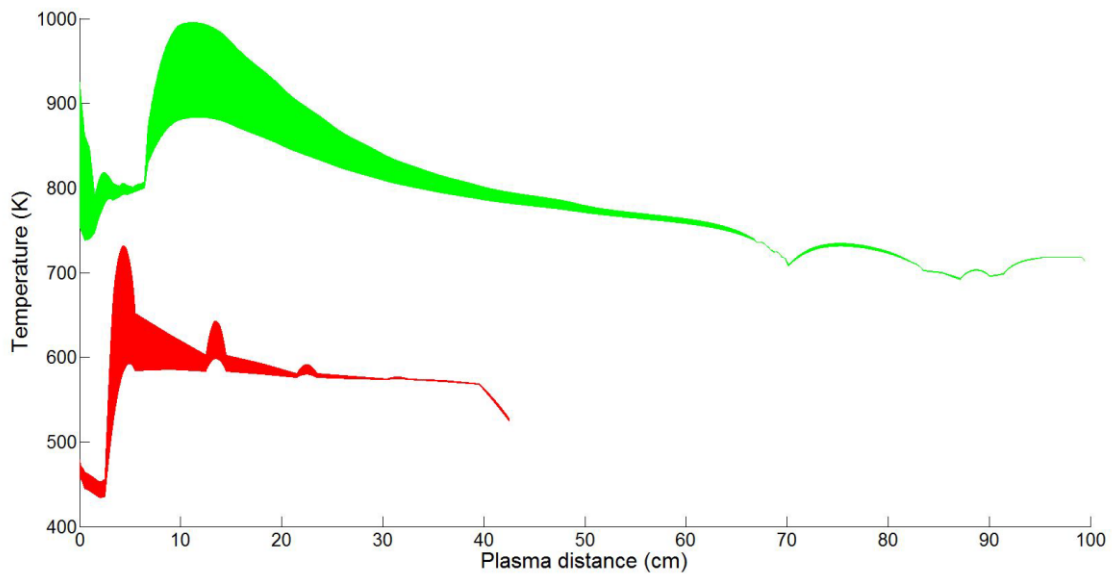


Figure 487: HCLL DEMO2 Fueling Rate sudden increase x1.5 evolution of the BB and divertor temperature graphic.

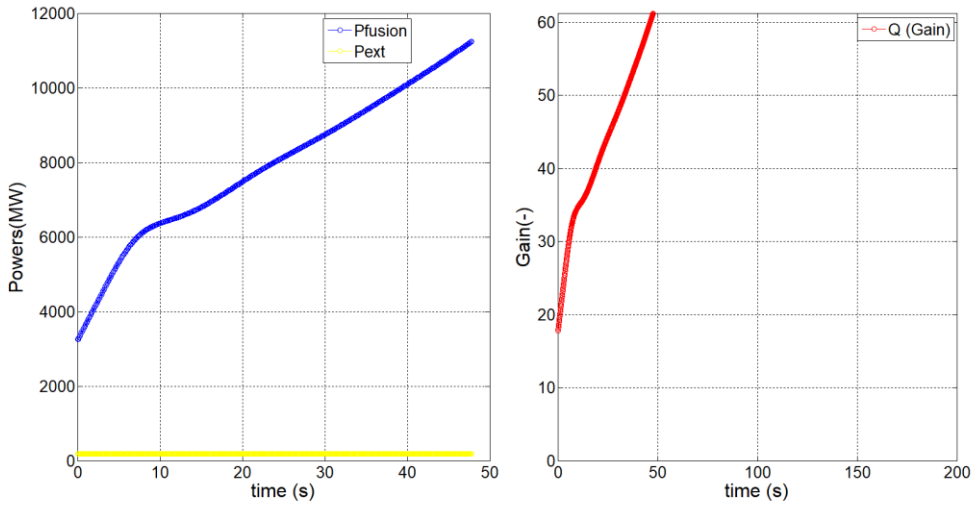


Figure 488: HCLL DEMO2 Fuelling Rate sudden increase x2  $P_{fus}$  and gain graphic.

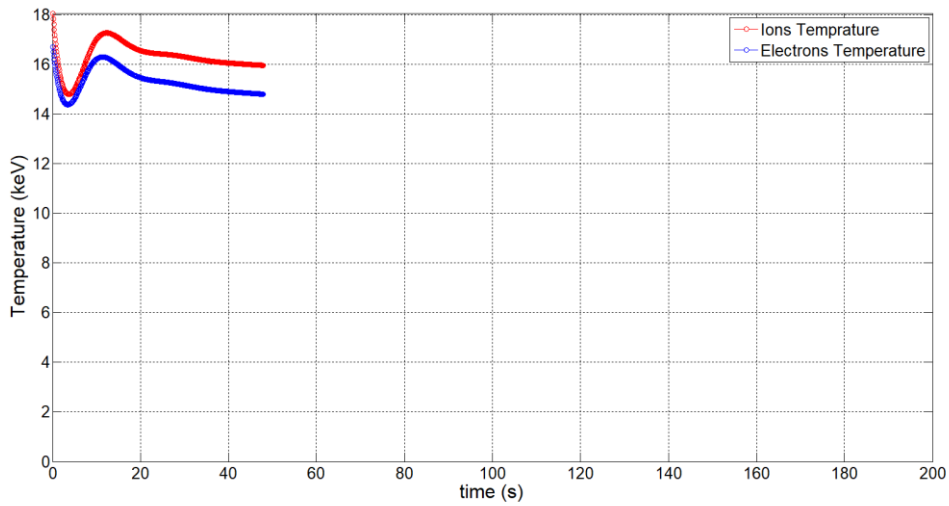


Figure 489: HCLL DEMO2 Fuelling Rate sudden increase x2 Temperatures graphic.

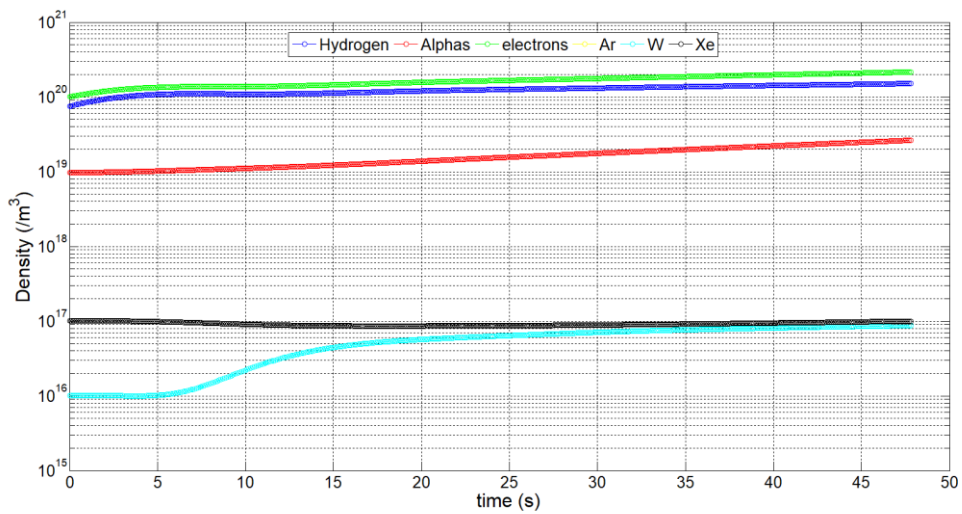


Figure 490: HCLL DEMO2 Fuelling Rate sudden increase x2 Densities graphic.

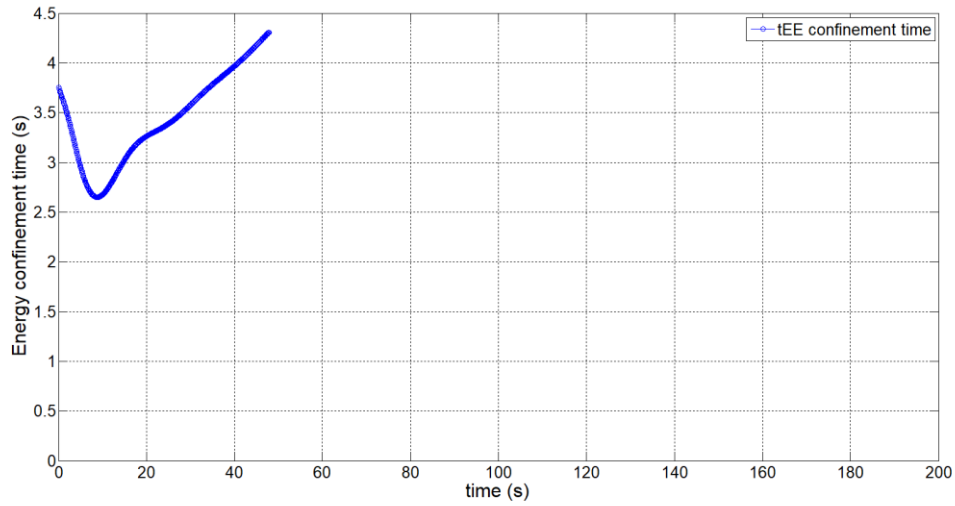


Figure 491: HCLL DEMO2 Fueling Rate sudden increase x2 Confinement time graphic.

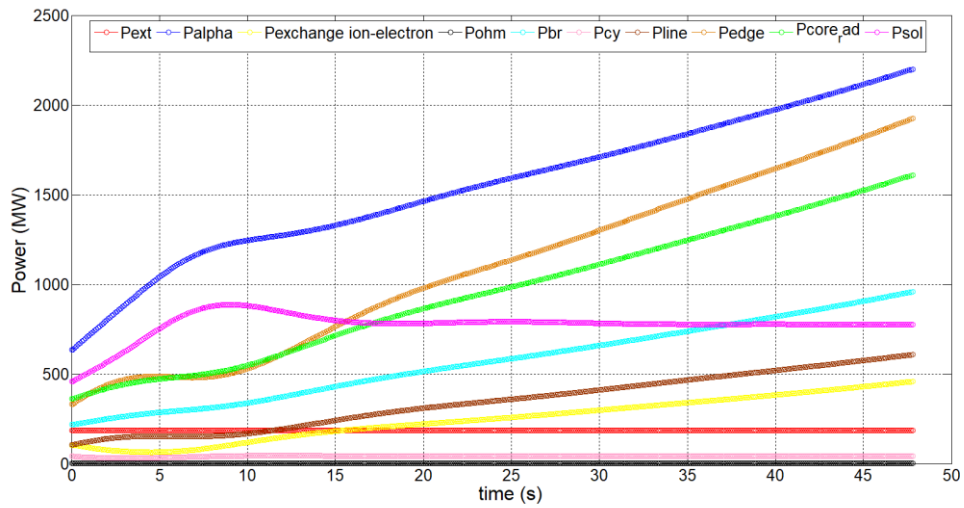


Figure 492: HCLL DEMO2 Fueling Rate sudden increase x2 Powers graphic.

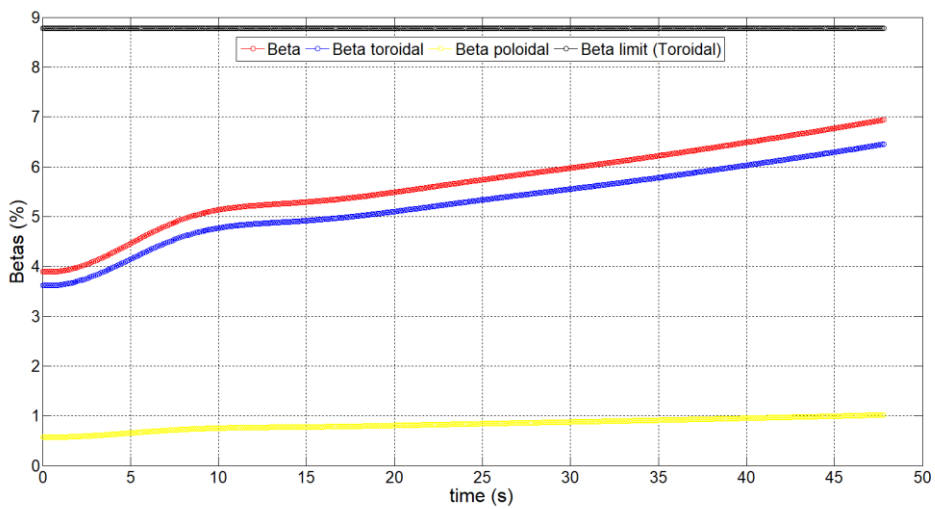


Figure 493: HCLL DEMO2 Fueling Rate sudden increase x2 Betas graphic.

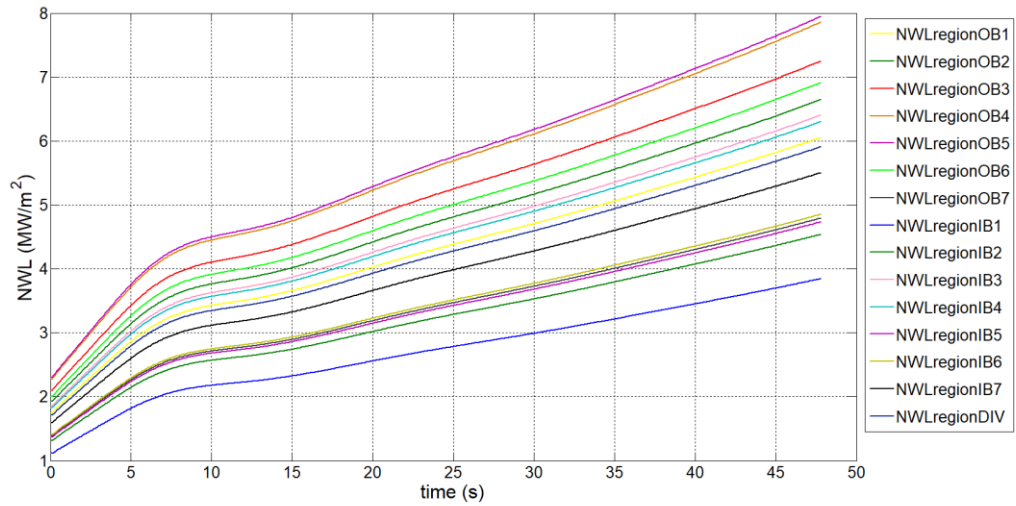


Figure 494: HCLL DEMO2 Fueling Rate sudden increase x2 NWL graphic.

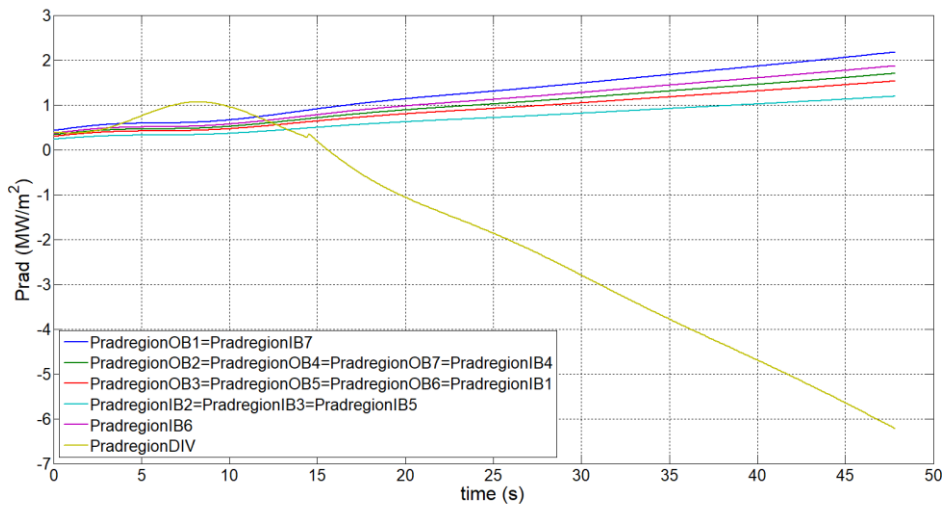


Figure 495: HCLL DEMO2 Fueling Rate sudden increase x2  $P_{rad}$  graphic.

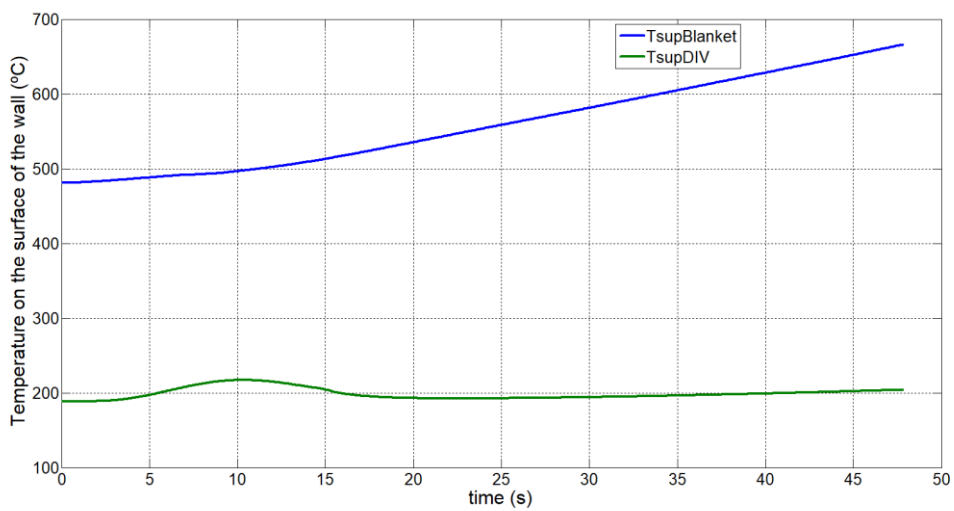


Figure 496: HCLL DEMO2 Fueling Rate sudden increase x2 Temperature on the surface of the blanket and divertor wall graphic.



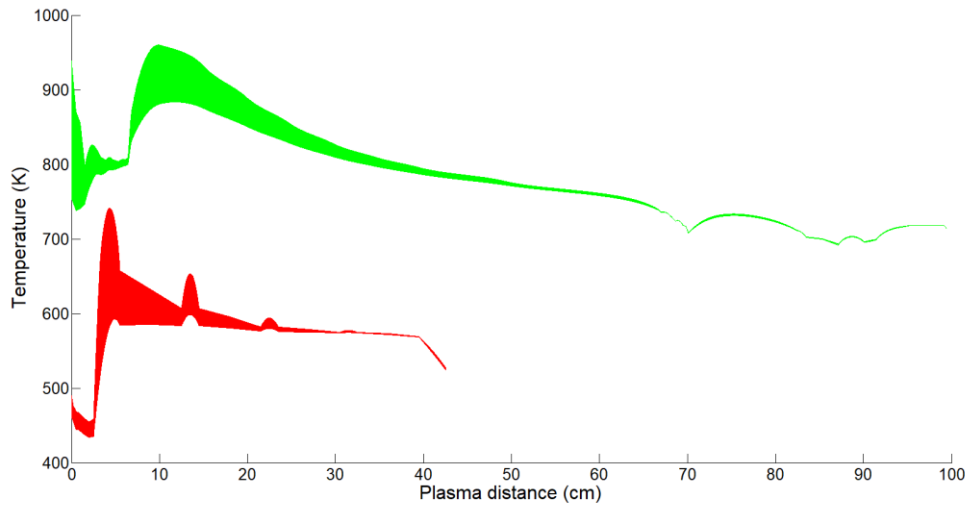


Figure 497: HCLL DEMO2 Fueling Rate sudden increase x2 evolution of the BB and divertor temperature graphic.

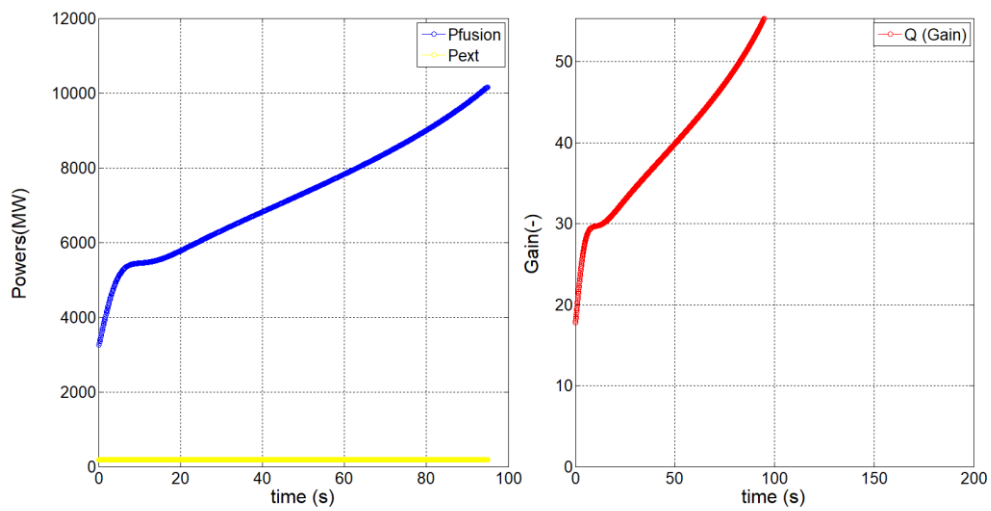


Figure 498: HCLL DEMO2 Confinement time improvement x1.5  $P_{fus}$  and gain graphic.

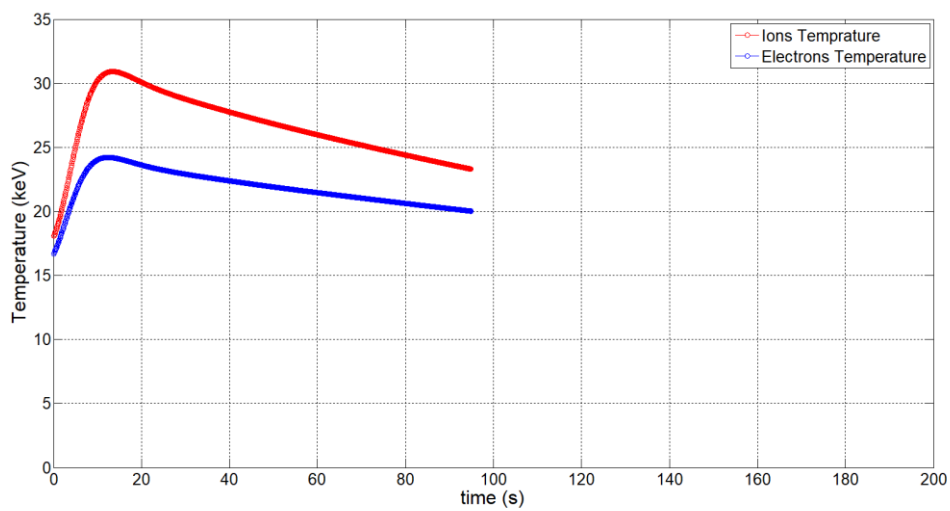


Figure 499: HCLL DEMO2 Confinement time improvement x1.5 Temperatures graphic.

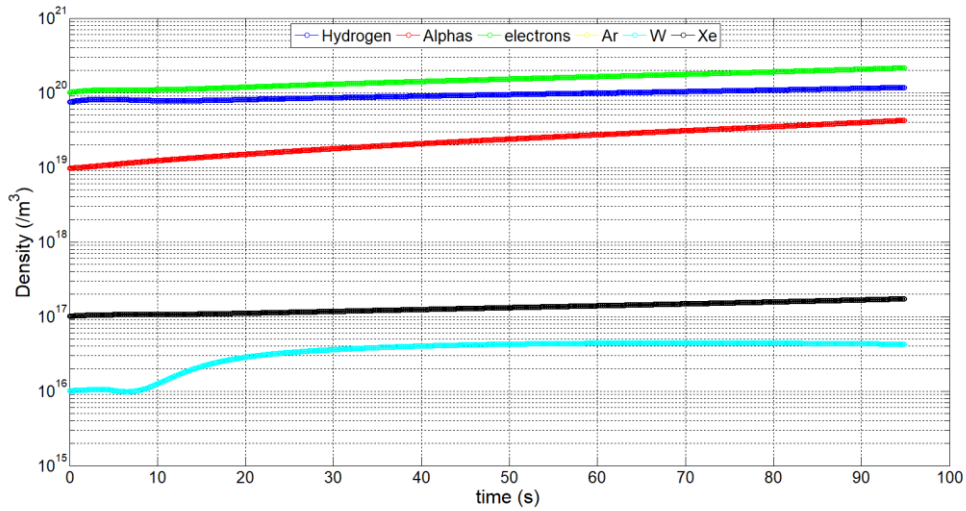


Figure 500: HCLL DEMO2 Confinement time improvement x1.5 Densities graphic.

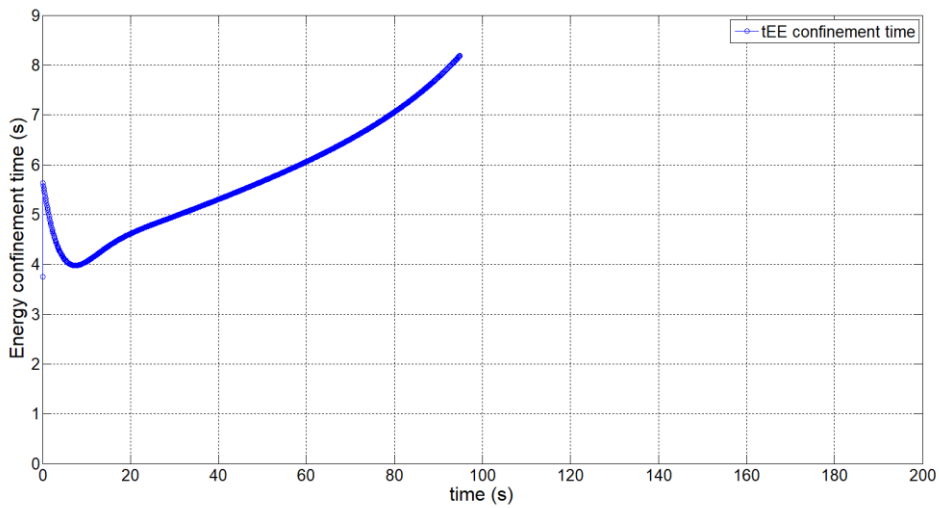


Figure 501: HCLL DEMO2 Confinement time improvement x1.5 Confinement time graphic.

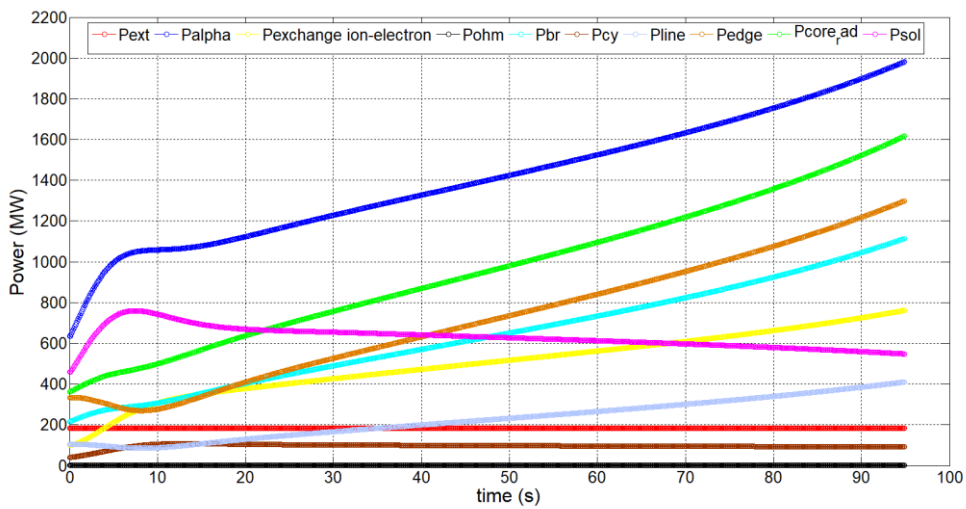


Figure 502: HCLL DEMO2 Confinement time improvement x1.5 Powers graphic.

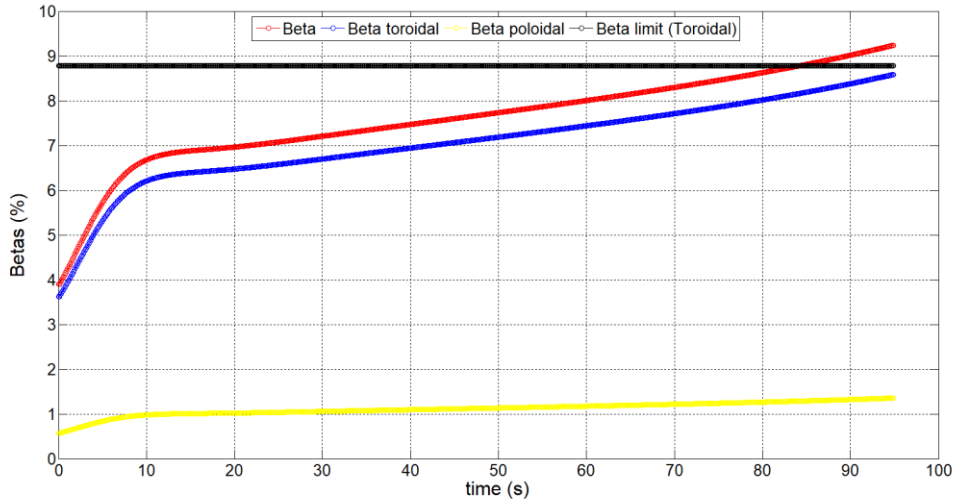


Figure 503: HCLL DEMO2 Confinement time improvement x1.5 Betas graphic.

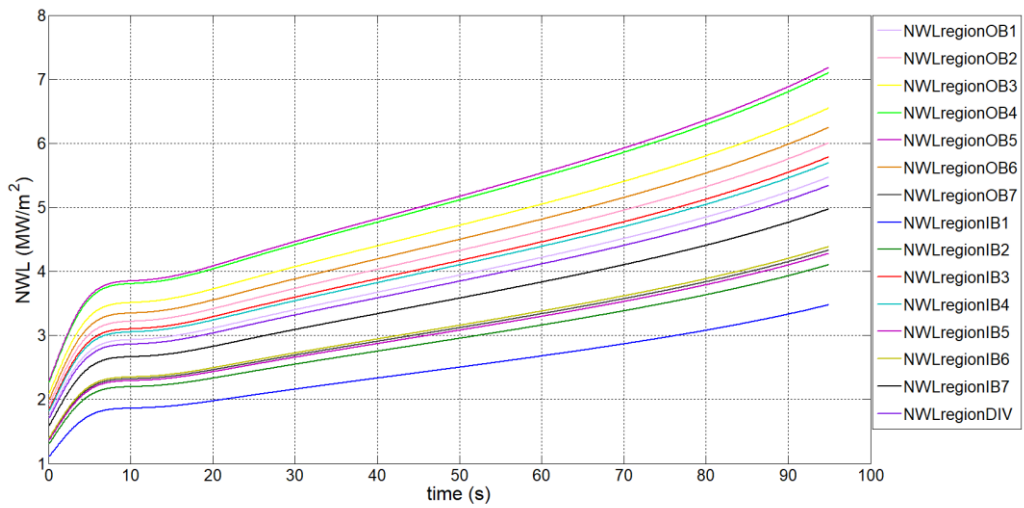


Figure 504: HCLL DEMO2 Confinement time improvement x1.5 NWL graphic.

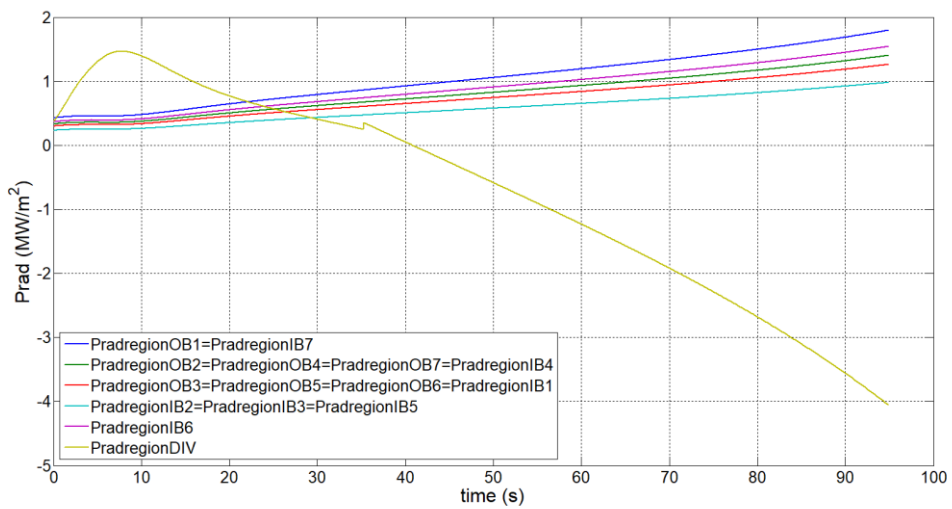


Figure 505: HCLL DEMO2 Confinement time improvement x1.5  $P_{rad}$  graphic.

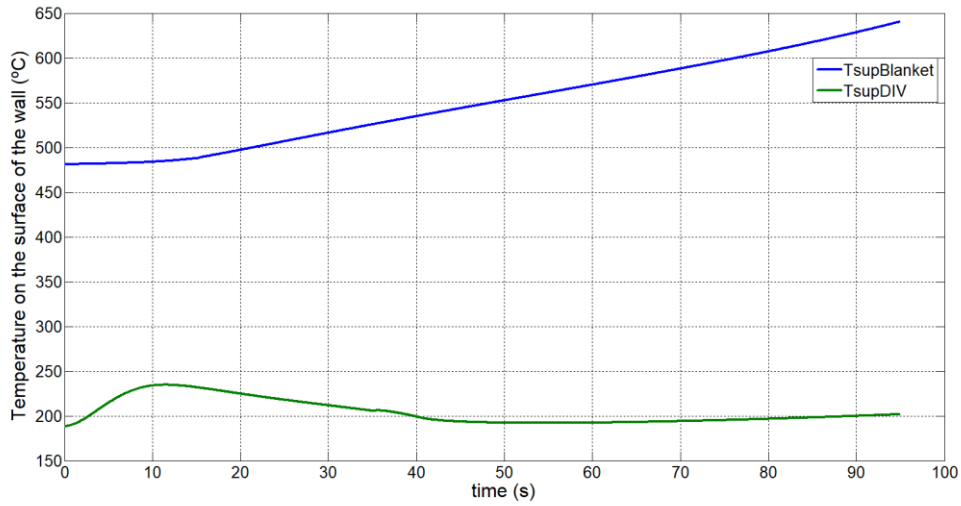


Figure 506: HCLL DEMO2 Confinement time improvement x1.5 Temperature on the surface of the blanket and divertor wall graphic.

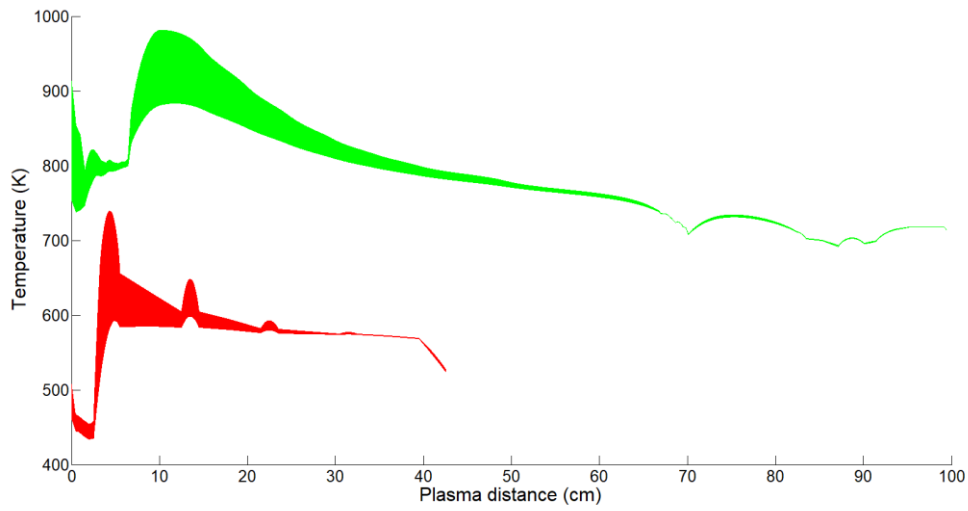


Figure 507: HCLL DEMO2 Confinement time improvement x1.5 evolution of the BB and divertor temperature graphic.

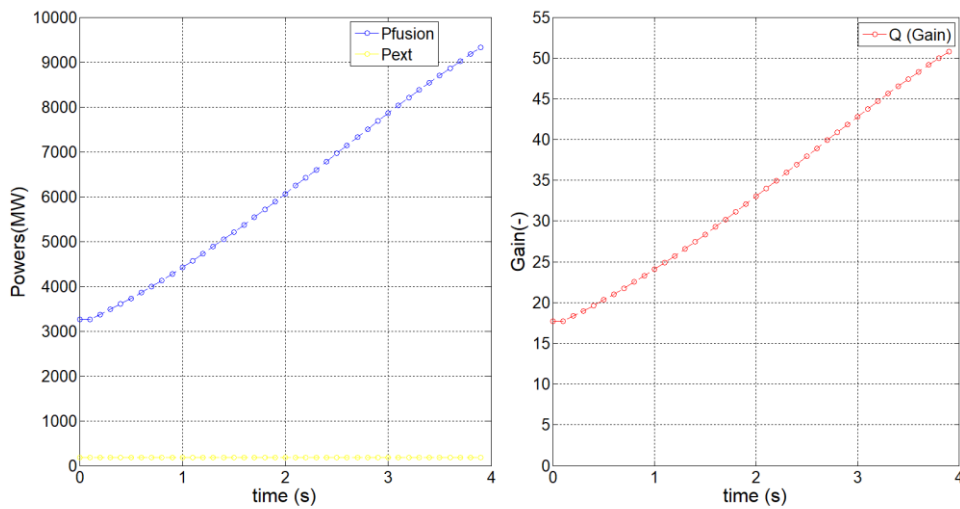


Figure 508: HCLL DEMO2 Confinement time improvement x5  $P_{fus}$  and gain graphic.

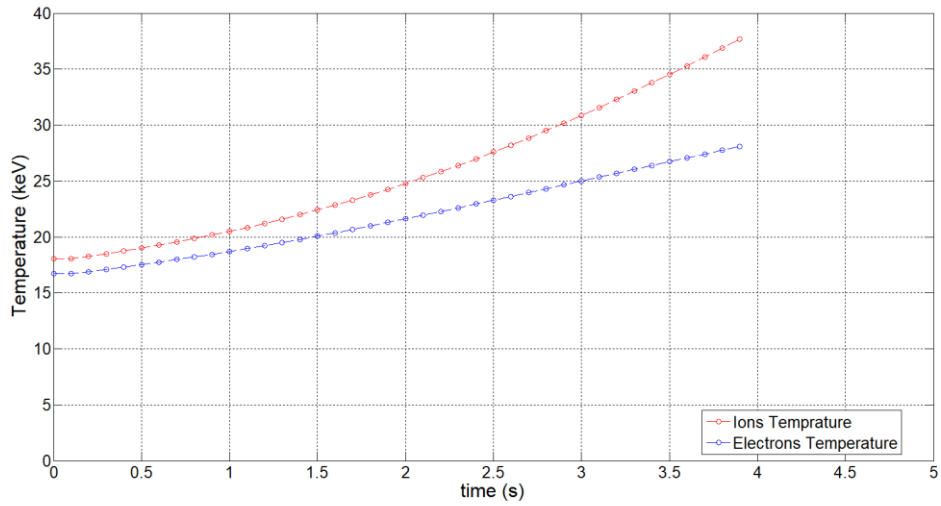


Figure 509: HCLL DEMO2 Confinement time improvement x5 Temperatures graphic.

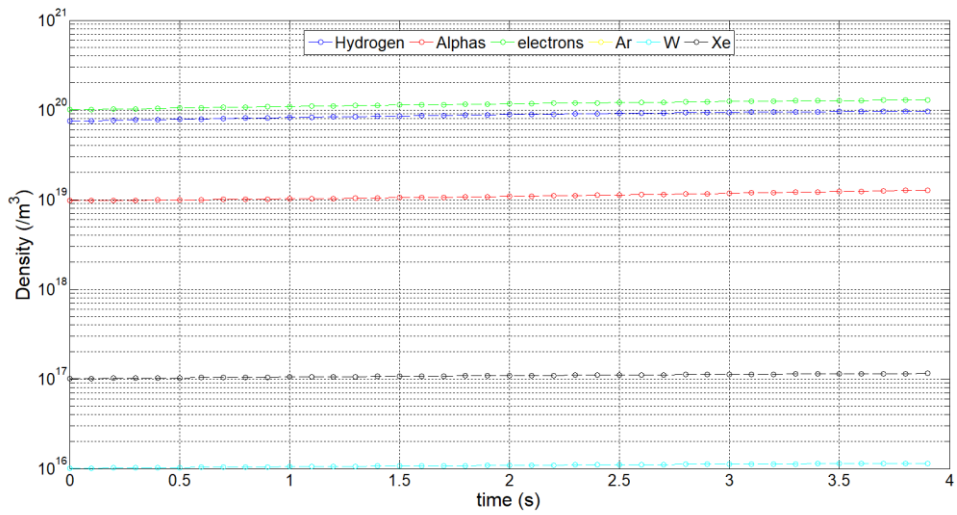


Figure 510: HCLL DEMO2 Confinement time improvement x5 Densities graphic.

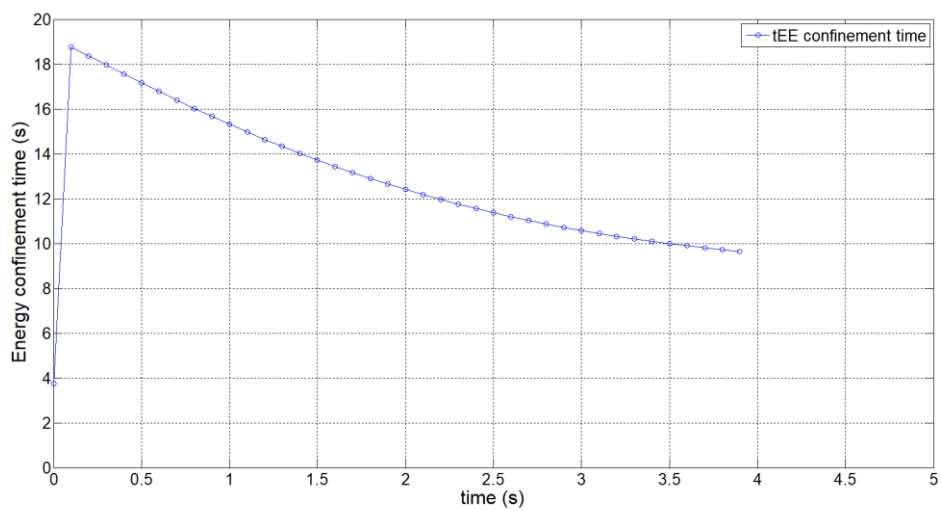


Figure 511: HCLL DEMO2 Confinement time improvement x5 Confinement time graphic.

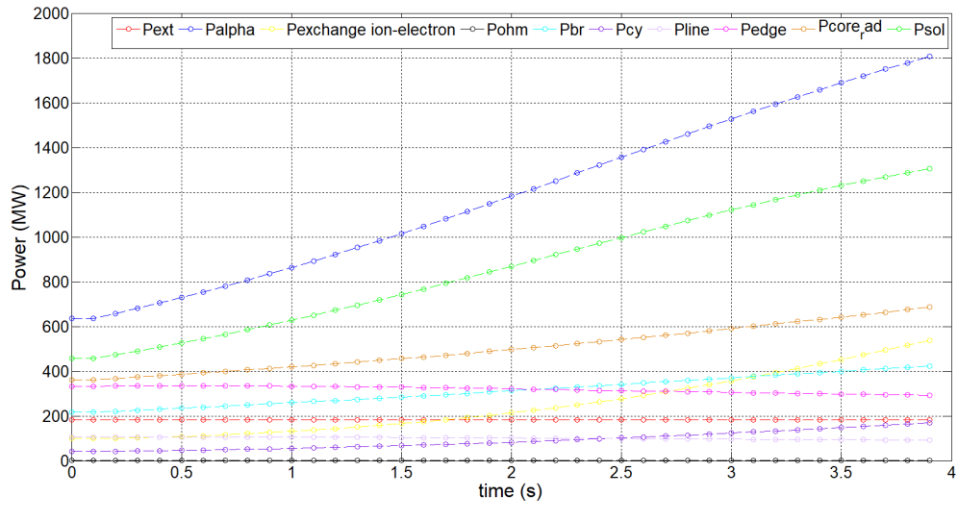


Figure 512: HCLL DEMO2 Confinement time improvement x5 Powers graphic.

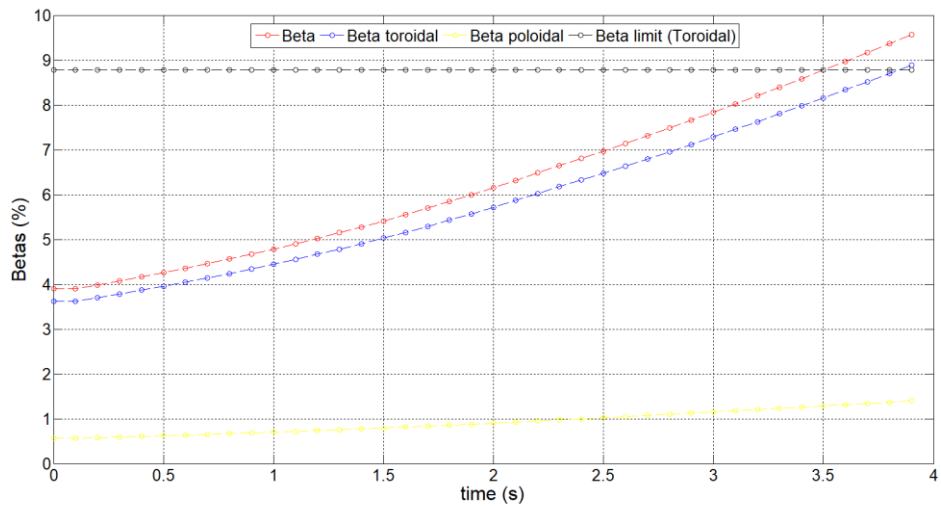


Figure 513: HCLL DEMO2 Confinement time improvement x5 Betas graphic.

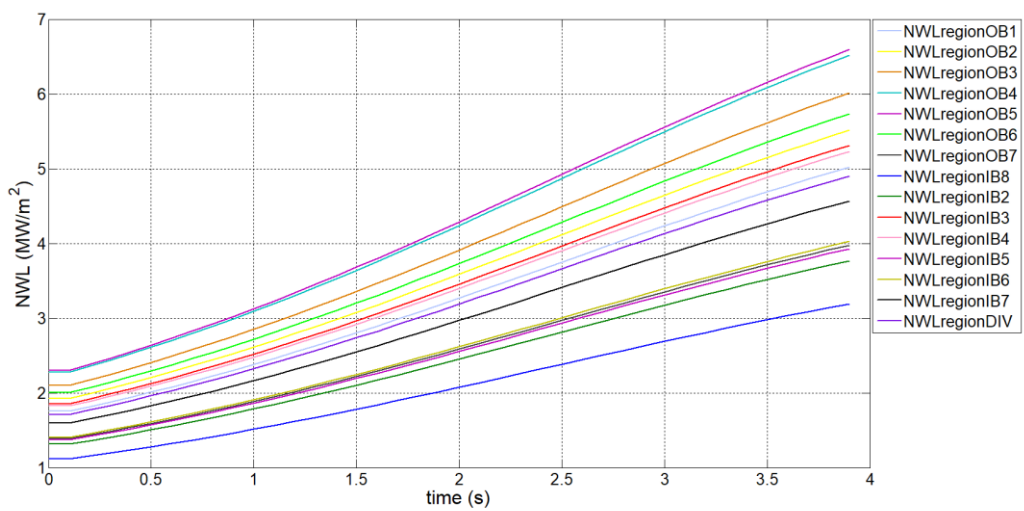


Figure 514: HCLL DEMO2 Confinement time improvement x5 NWL graphic.

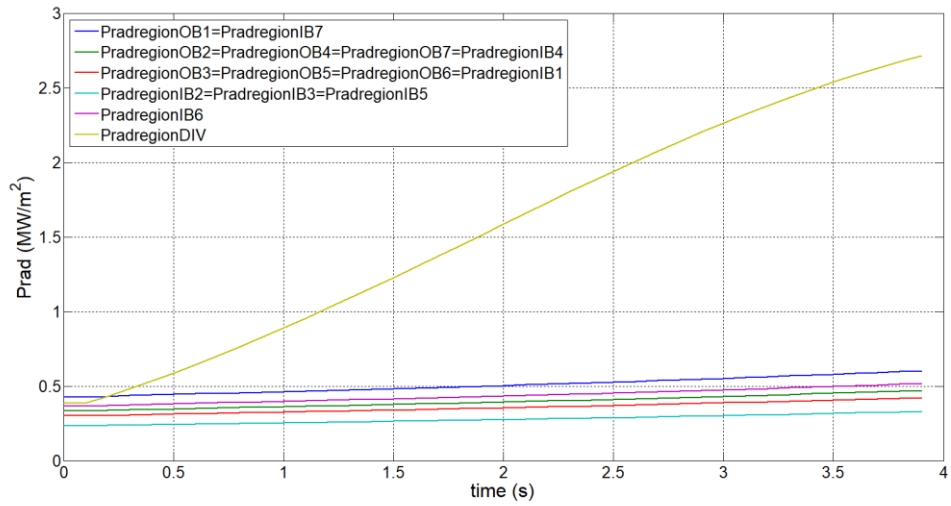


Figure 515: HCLL DEMO2 Confinement time improvement x5  $P_{rad}$  graphic.

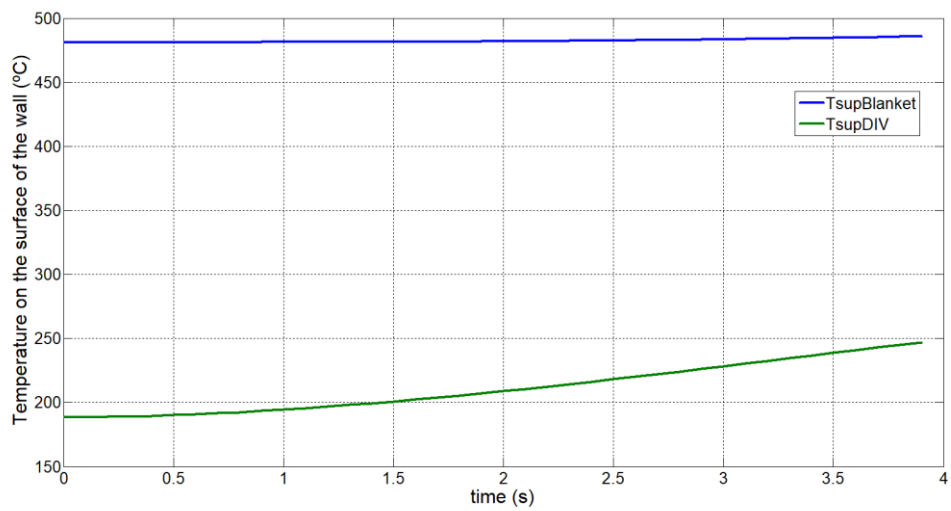


Figure 516: HCLL DEMO2 Confinement time improvement x5 Temperature on the surface of the blanket and divertor wall graphic.

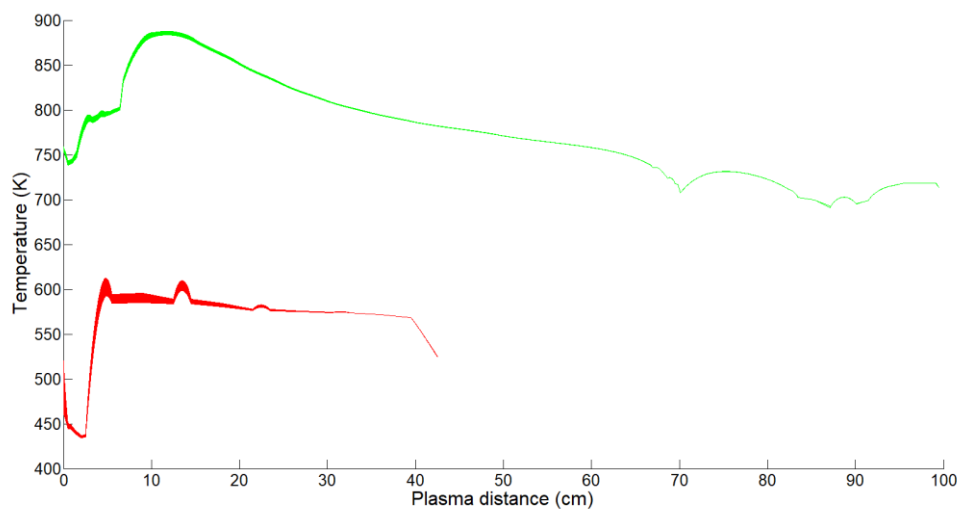


Figure 517: HCLL DEMO2 Confinement time improvement x5 evolution of the BB and divertor temperature graphic.

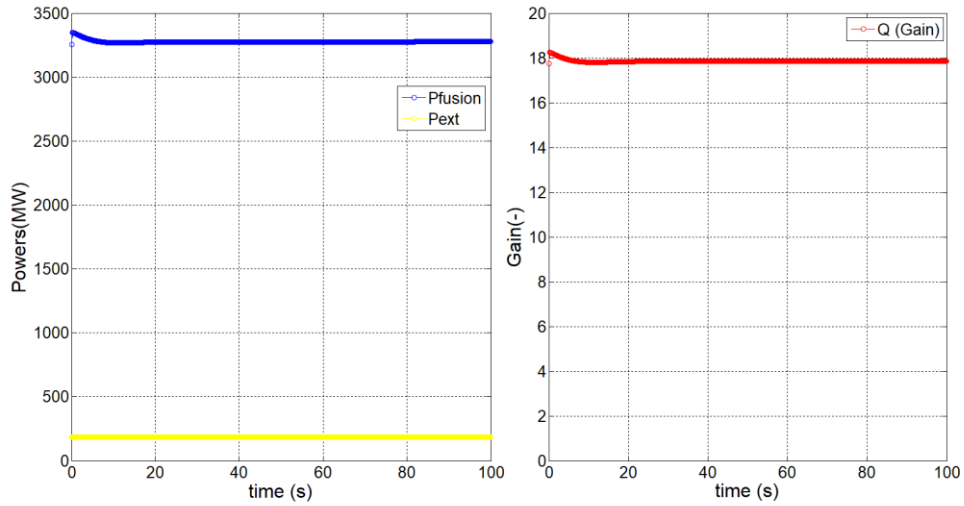


Figure 518: HCLL DEMO2 Occasional confinement time improvement x3  $P_{fus}$  and gain graphic.

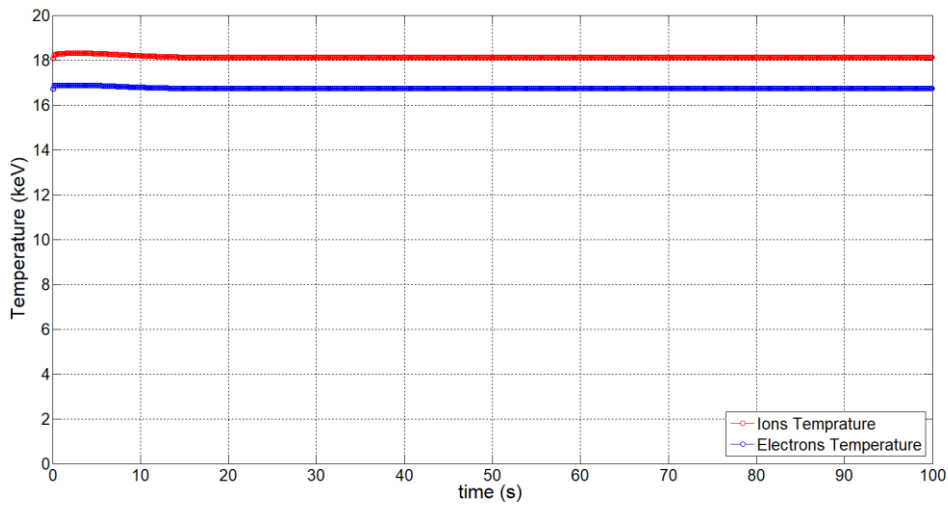


Figure 519: HCLL DEMO2 Occasional confinement time improvement x3 Temperatures graphic.

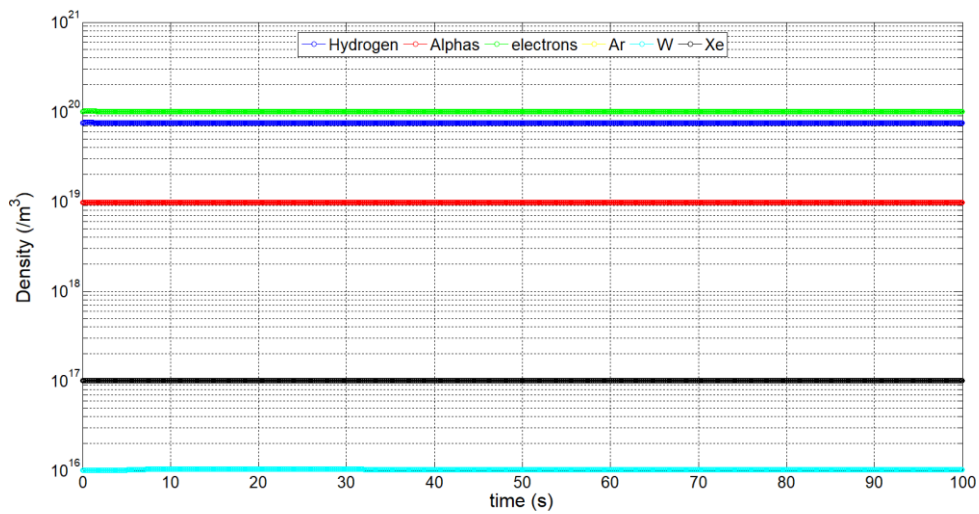


Figure 520: HCLL DEMO2 Occasional confinement time improvement x3 Densities graphic.



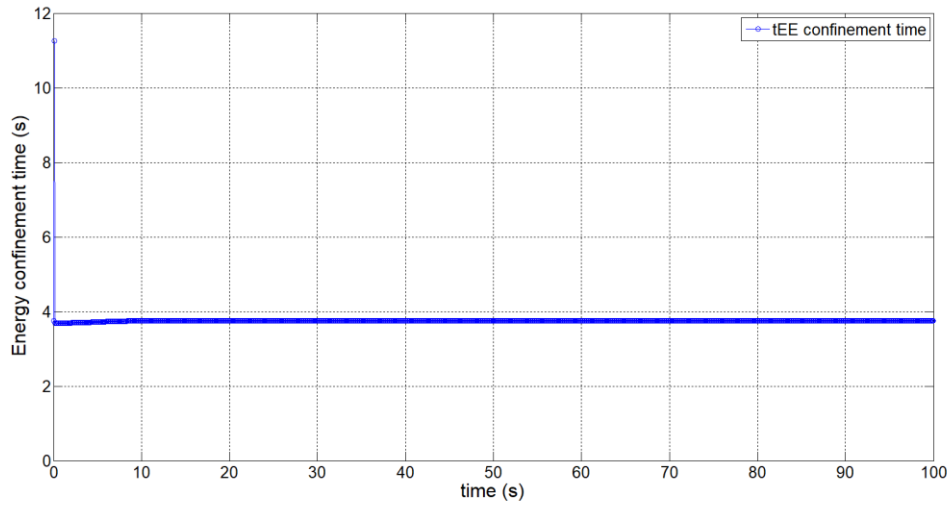


Figure 521: HCLL DEMO2 Occasional confinement time improvement x3 Confinement time graphic.

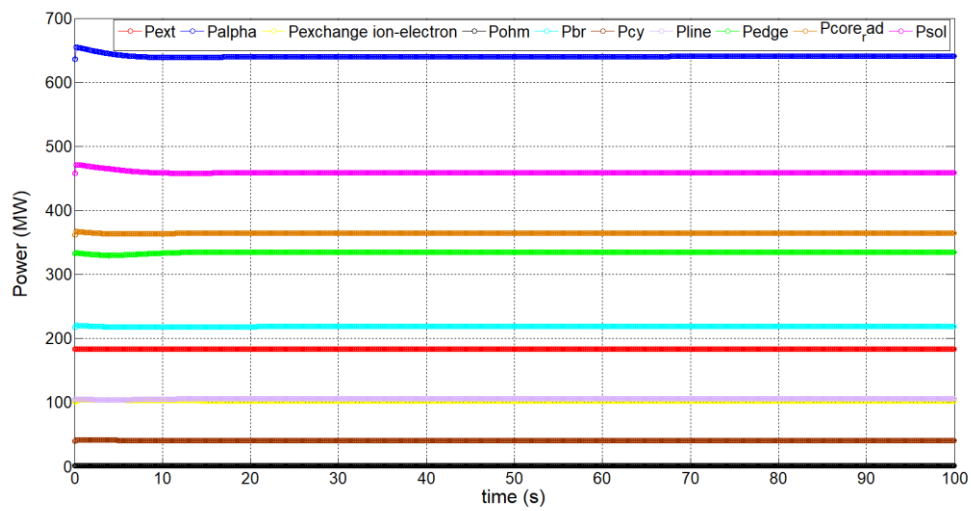


Figure 522: HCLL DEMO2 Occasional confinement time improvement x3 Powers graphic.

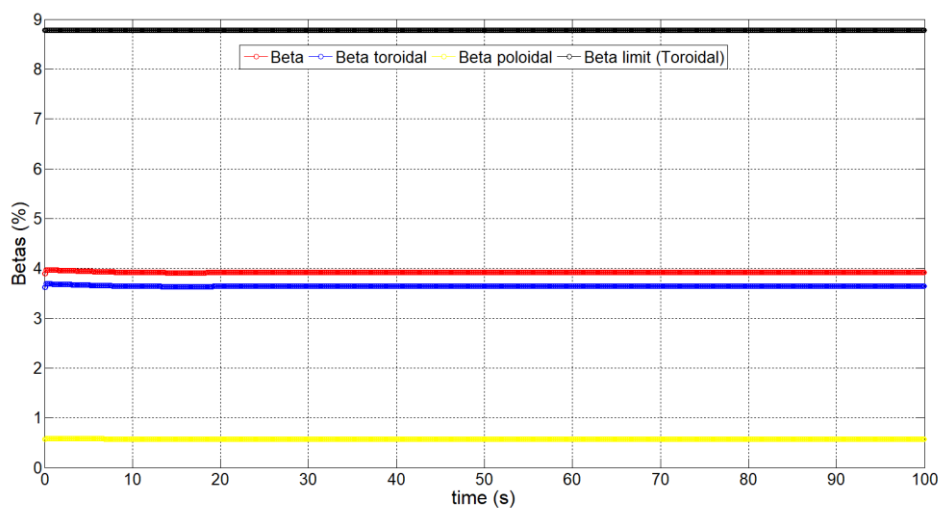


Figure 523: HCLL DEMO2 Occasional confinement time improvement x3 Betas graphic.

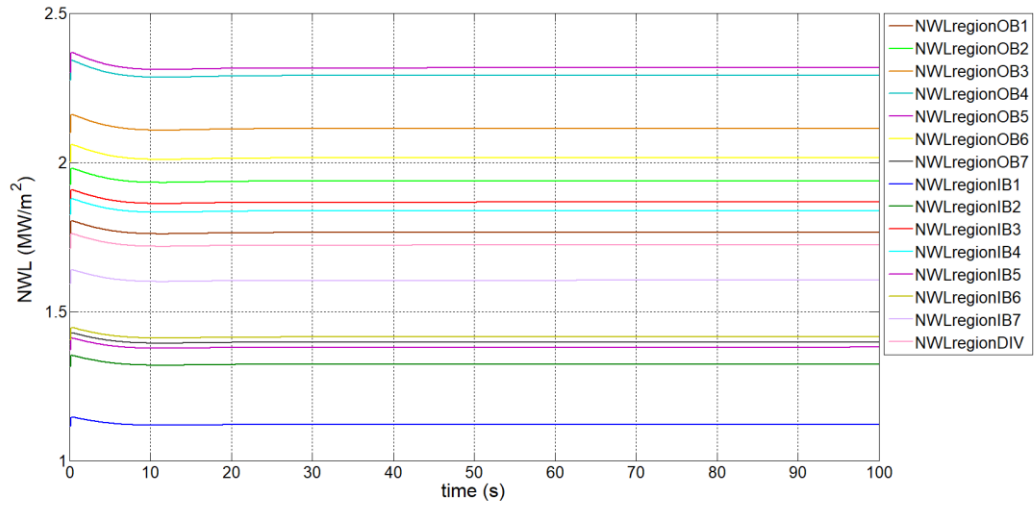


Figure 524: HCLL DEMO2 Occasional confinement time improvement x3 NWL graphic.

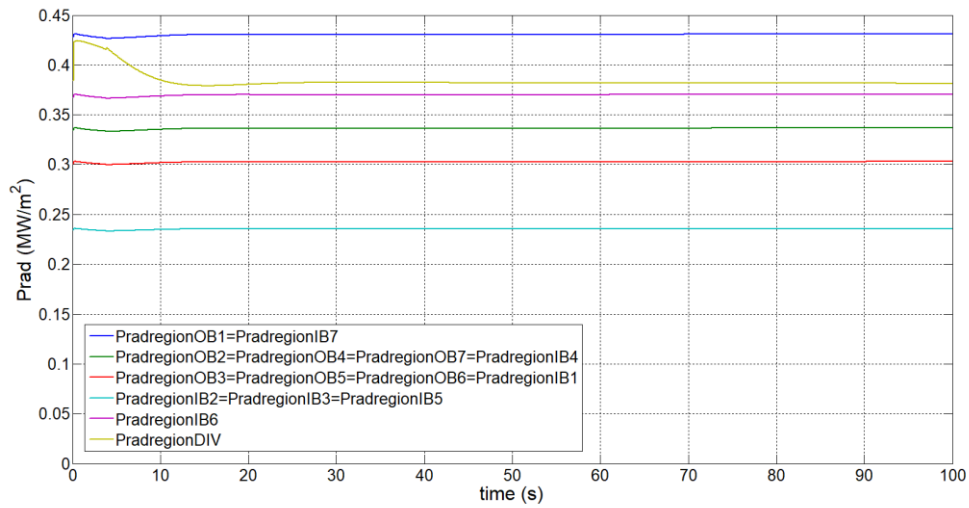


Figure 525: HCLL DEMO2 Occasional confinement time improvement x3 P<sub>rad</sub> graphic.

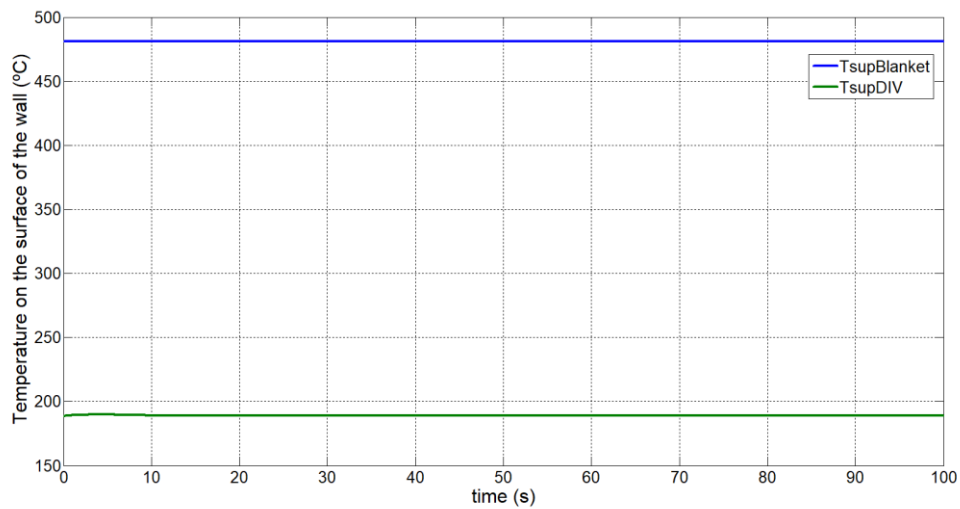


Figure 526: HCLL DEMO2 Occasional confinement time improvement x3 Temperature on the surface of the blanket and divertor wall graphic.

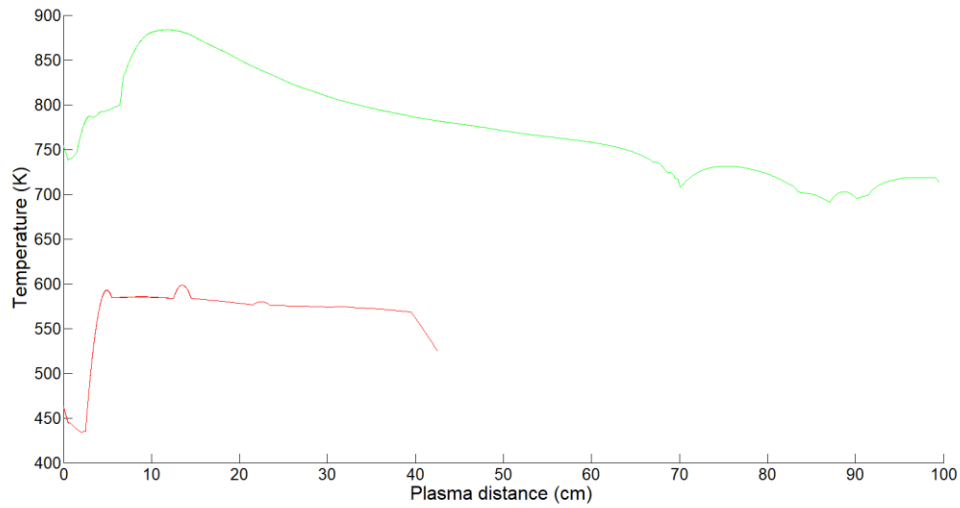


Figure 527: HCLL DEMO2 Occasional confinement time improvement x3 evolution of the BB and divertor temperature graphic.

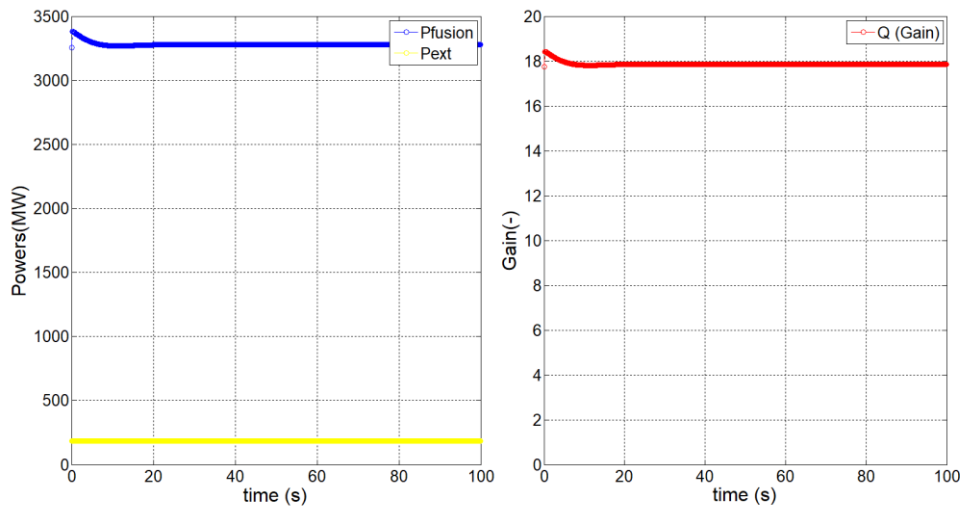


Figure 528: HCLL DEMO2 Occasional confinement time improvement x10  $P_{fus}$  and gain graphic.

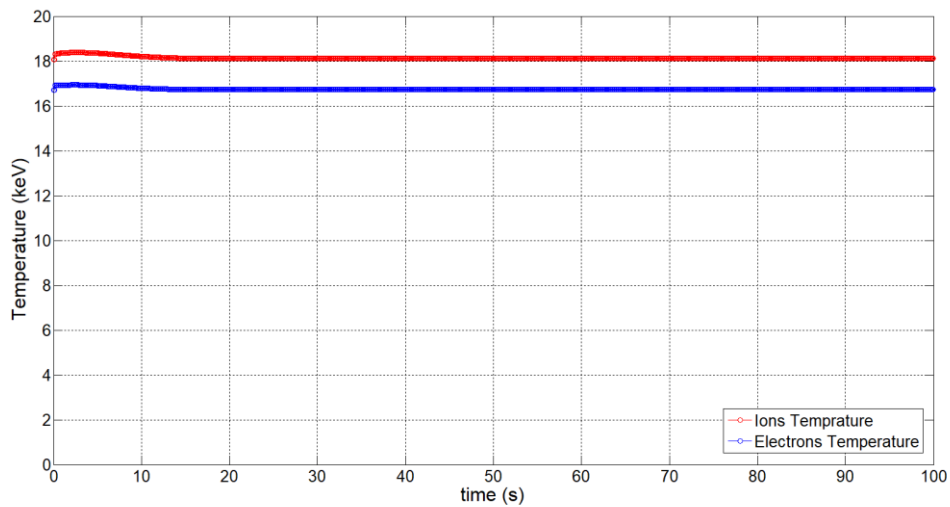


Figure 529: HCLL DEMO2 Occasional confinement time improvement x10 Temperatures graphic.

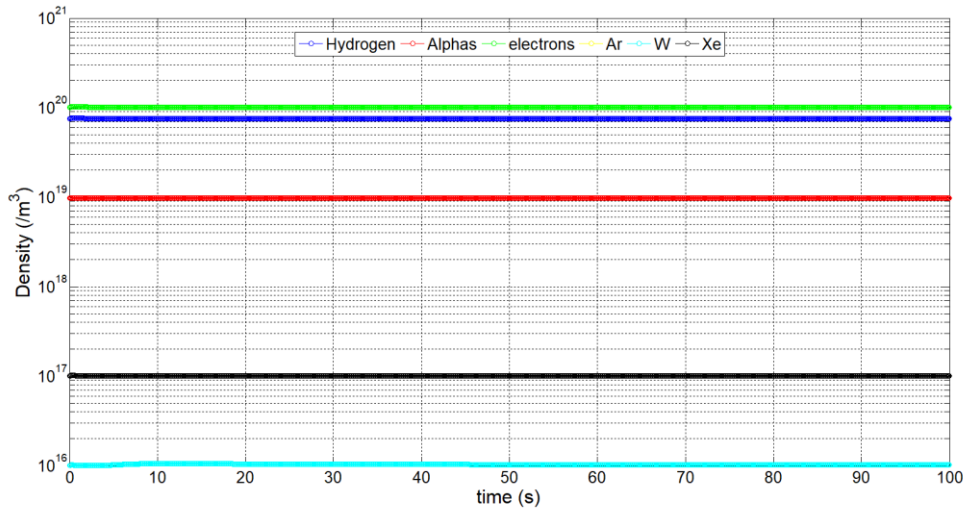


Figure 530: HCLL DEMO2 Occasional confinement time improvement x10 Densities graphic.

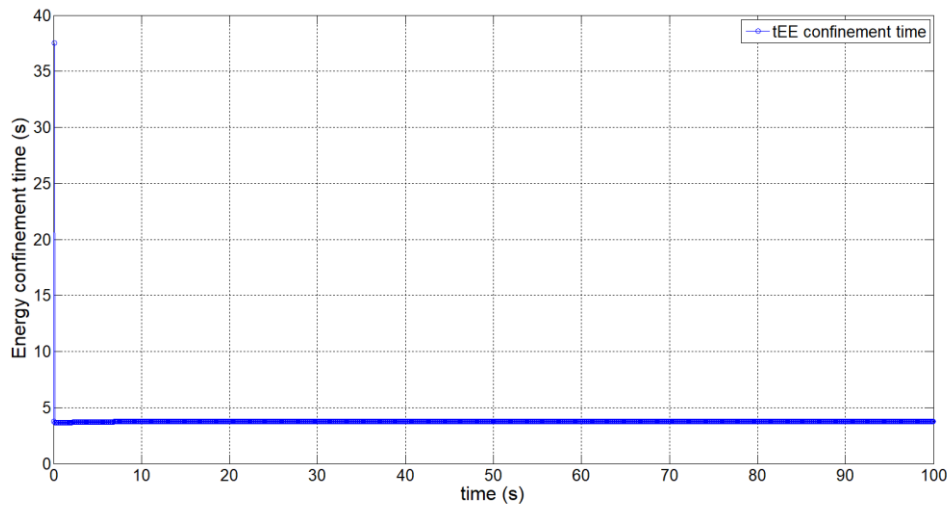


Figure 531: HCLL DEMO2 Occasional confinement time improvement x10 Confinement time graphic.

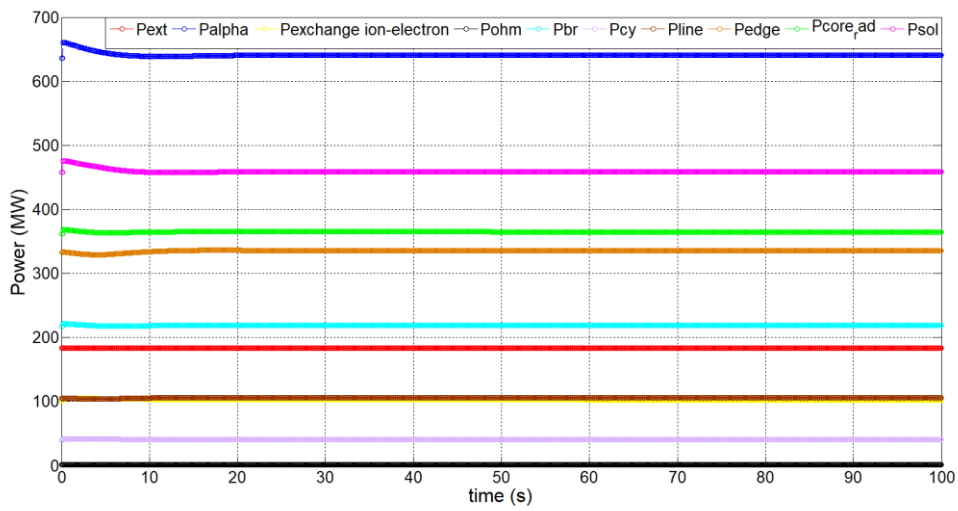


Figure 532: HCLL DEMO2 Occasional confinement time improvement x10 Powers graphic.

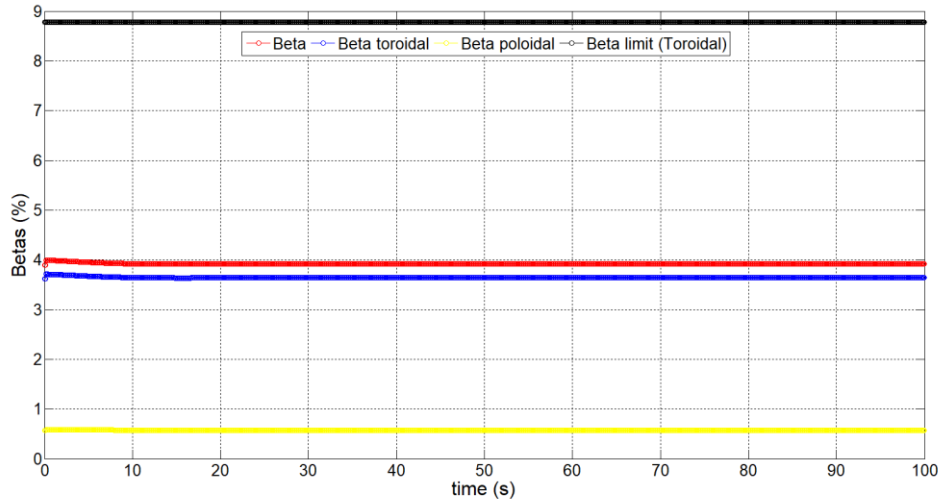


Figure 533: HCLL DEMO2 Occasional confinement time improvement x10 Betas graphic.

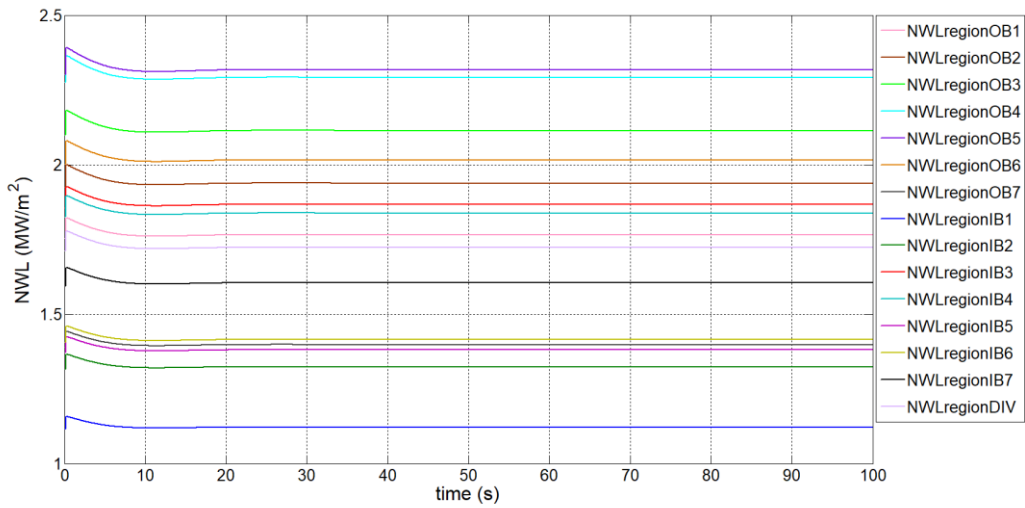


Figure 534: HCLL DEMO2 Occasional confinement time improvement x10 NWL graphic.

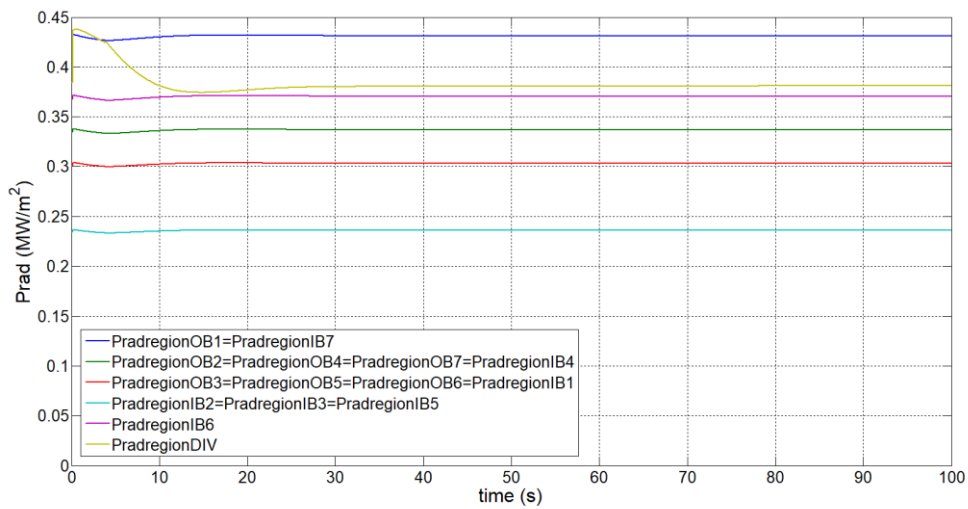


Figure 535: HCLL DEMO2 Occasional confinement time improvement x10  $P_{rad}$  graphic.

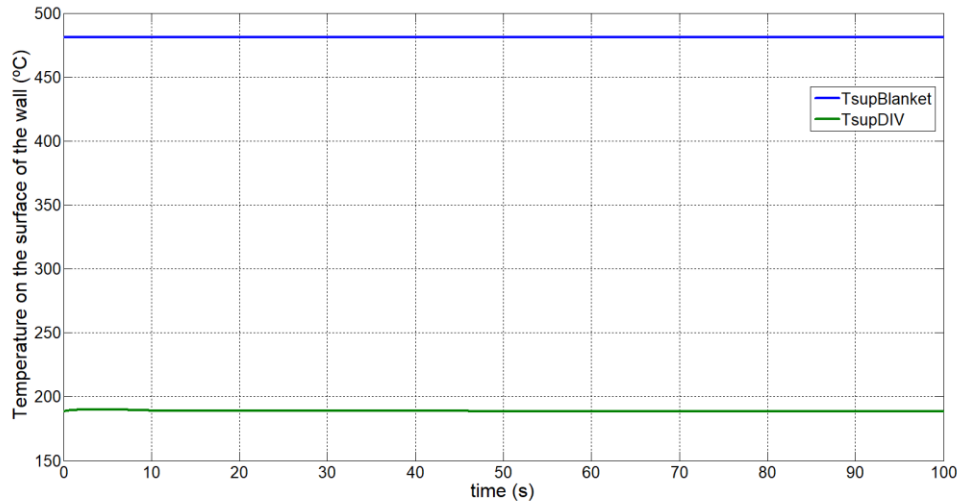


Figure 536: HCLL DEMO2 Occasional confinement time improvement x10 Temperature on the surface of the blanket and divertor wall graphic.

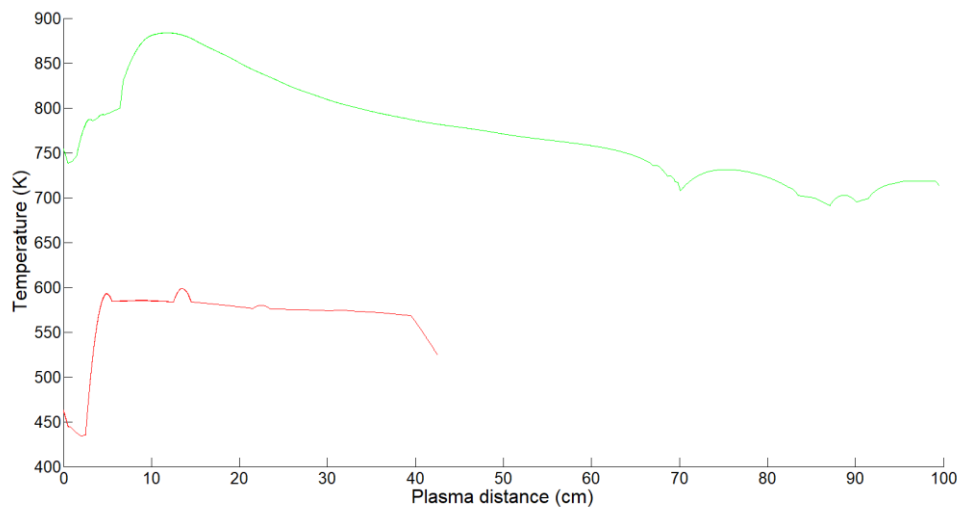


Figure 537: HCLL DEMO2 Occasional confinement time improvement x10 evolution of the BB and divertor temperature graphic.

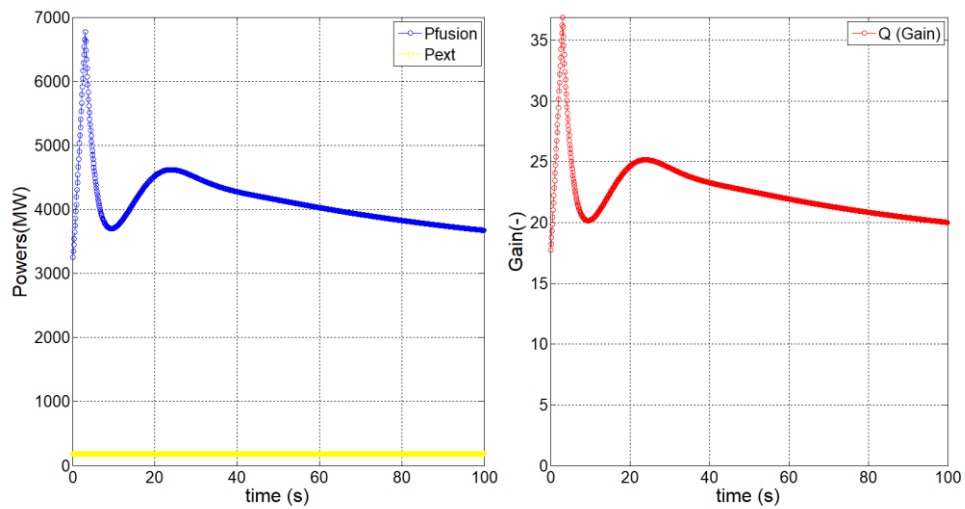


Figure 538: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s)  $P_{fus}$  and gain graphic.

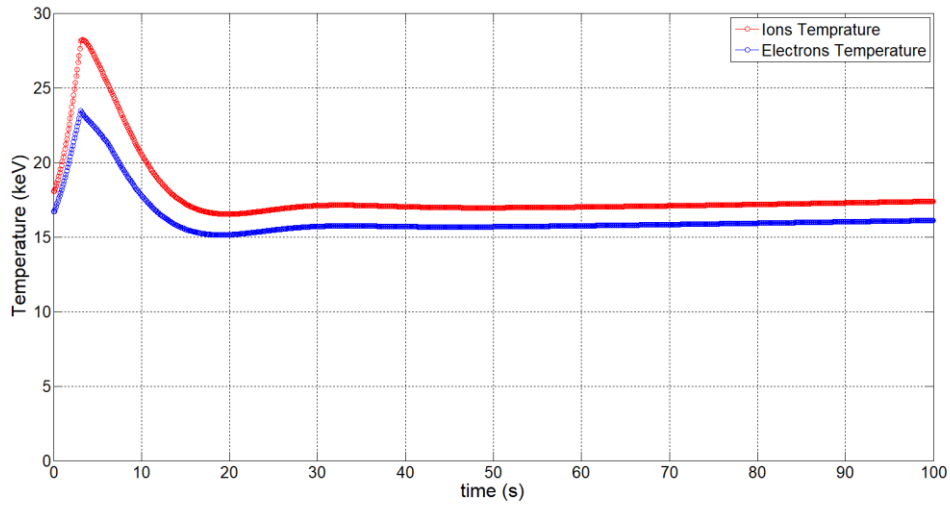


Figure 539: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s) Temperatures graphic.

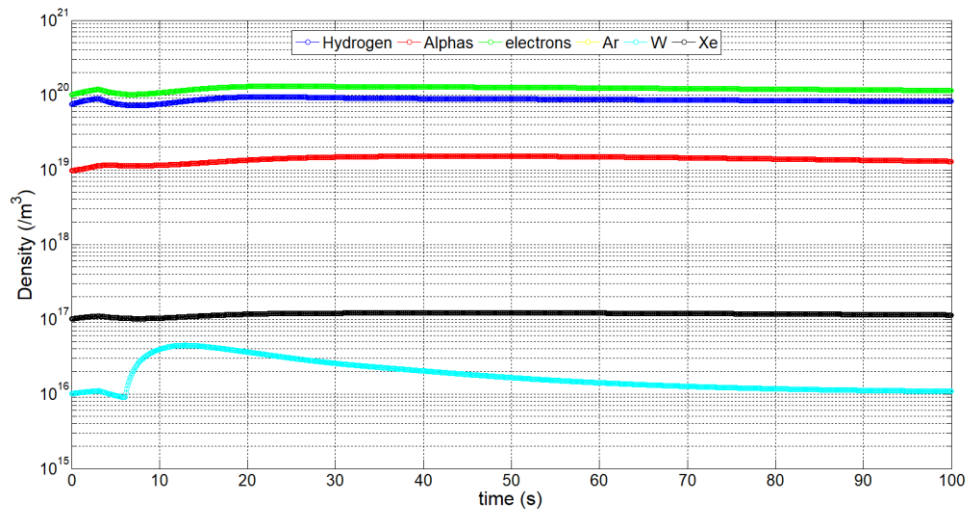


Figure 540: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s) Densities graphic.

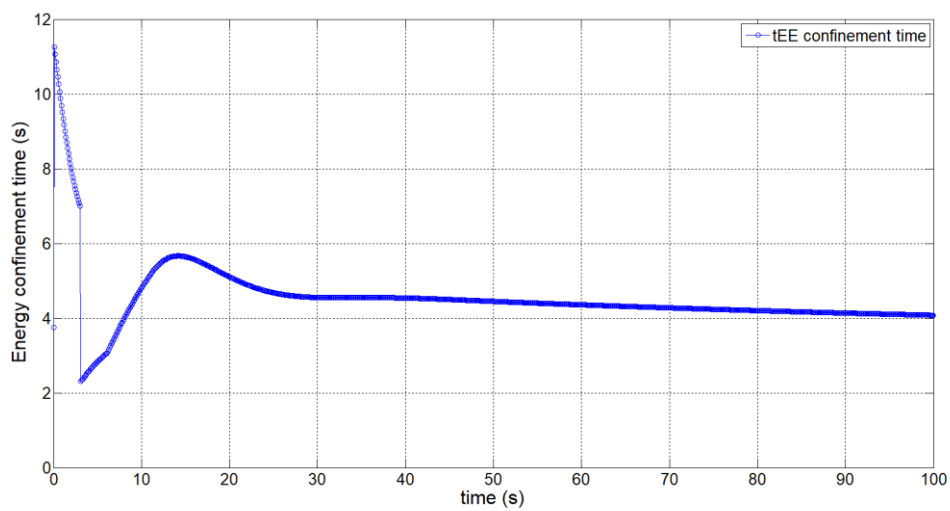


Figure 541: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s) Confinement time graphic.

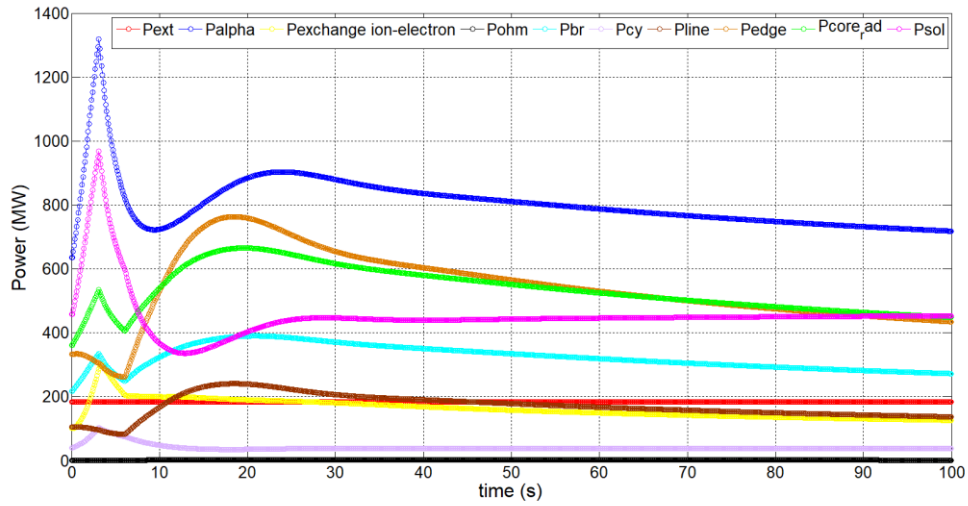


Figure 542: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s) Powers graphic.

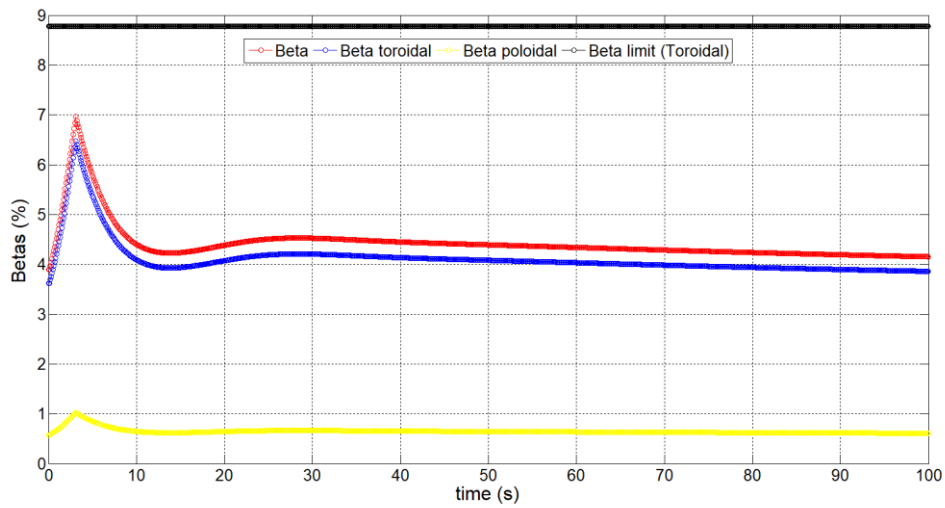


Figure 543: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s) Betas graphic.

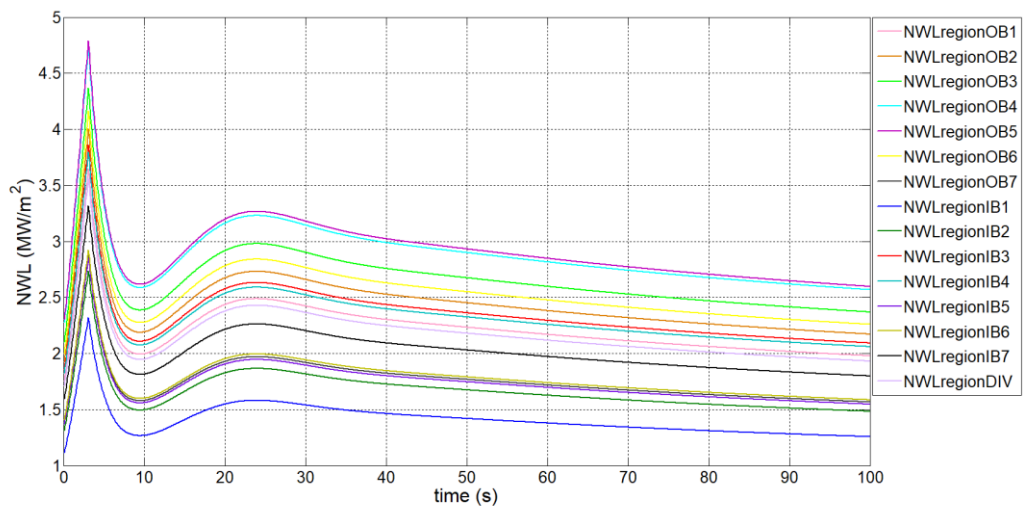


Figure 544: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s) NWL graphic.



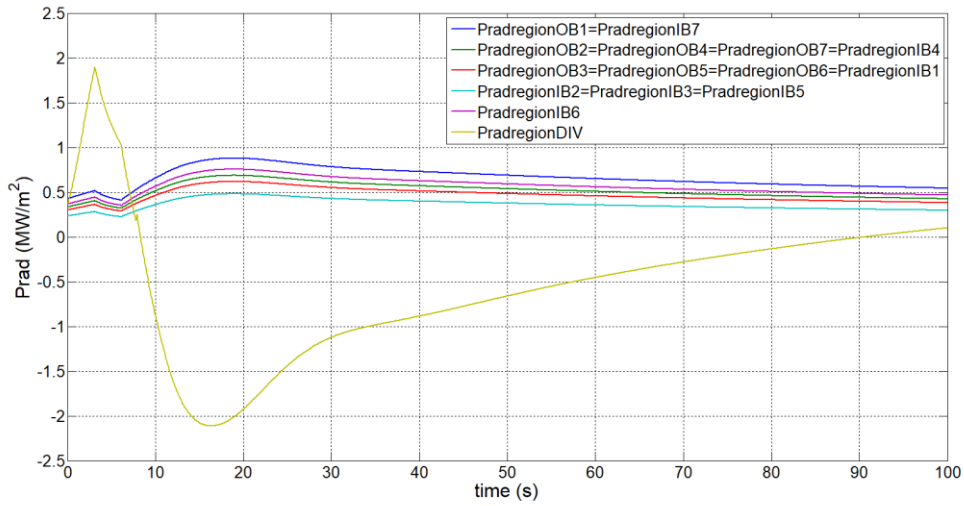


Figure 545: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s)  $P_{rad}$  graphic.

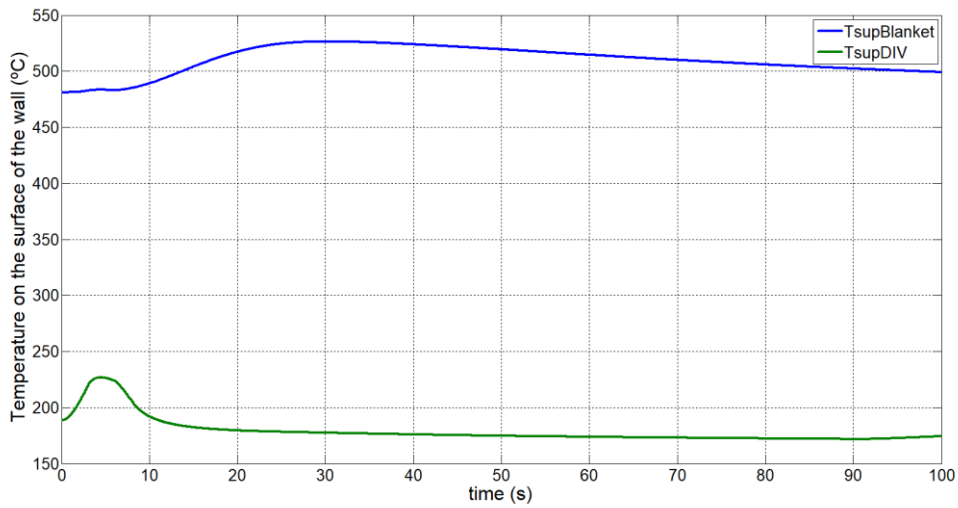


Figure 546: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s) Temperature on the surface of the blanket and divertor wall graphic.

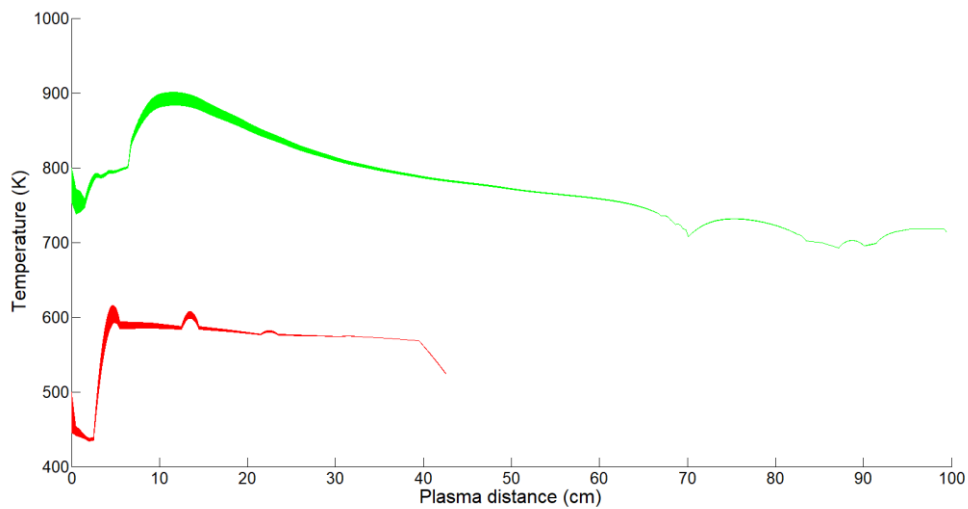


Figure 547: HCLL DEMO2 Occasional confinement time improvement x3 (during 3s) evolution of the BB and divertor temperature graphic.

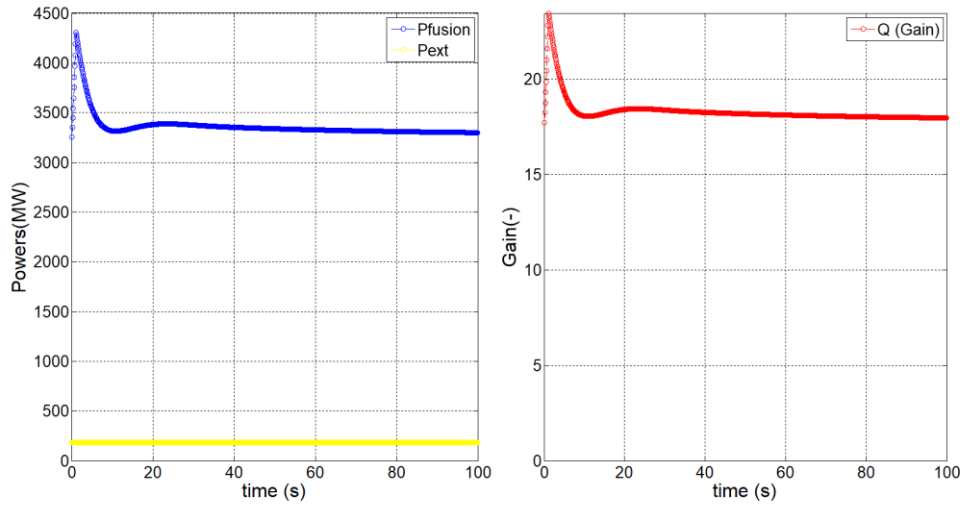


Figure 548: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s)  $P_{fus}$  and gain graphic.

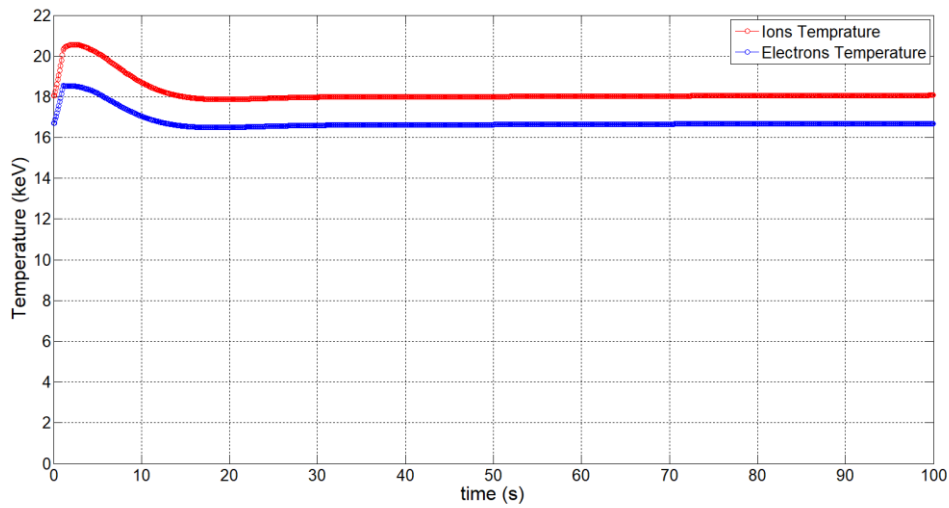


Figure 549: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s) Temperatures graphic.

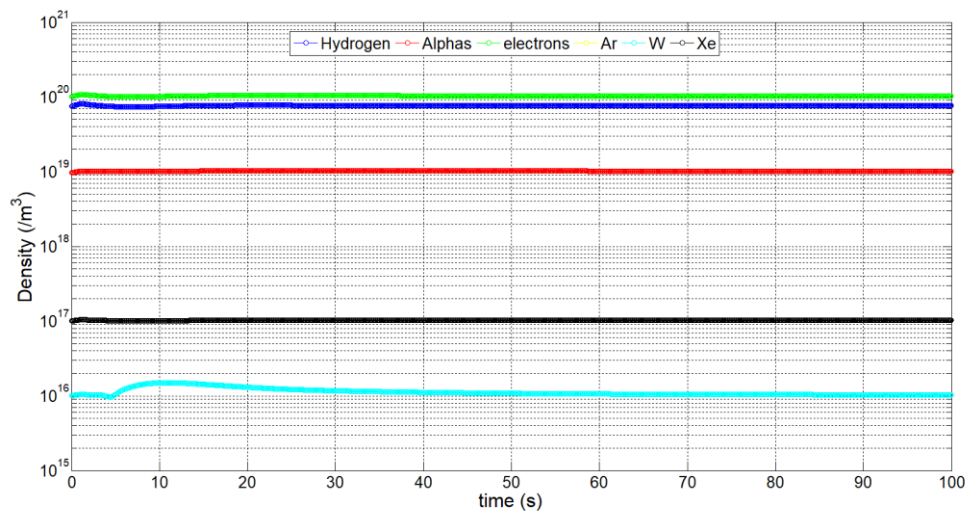


Figure 550: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s) Densities graphic.

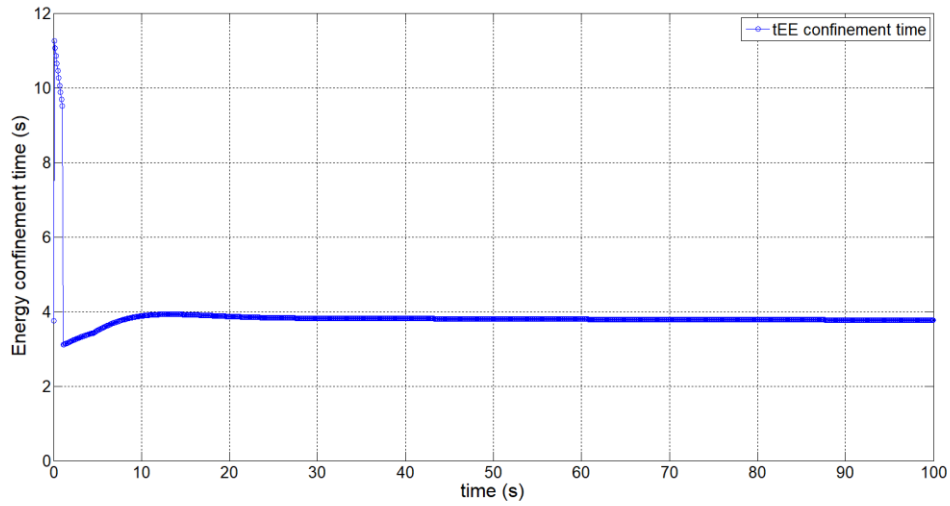


Figure 551: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s) Confinement time graphic.

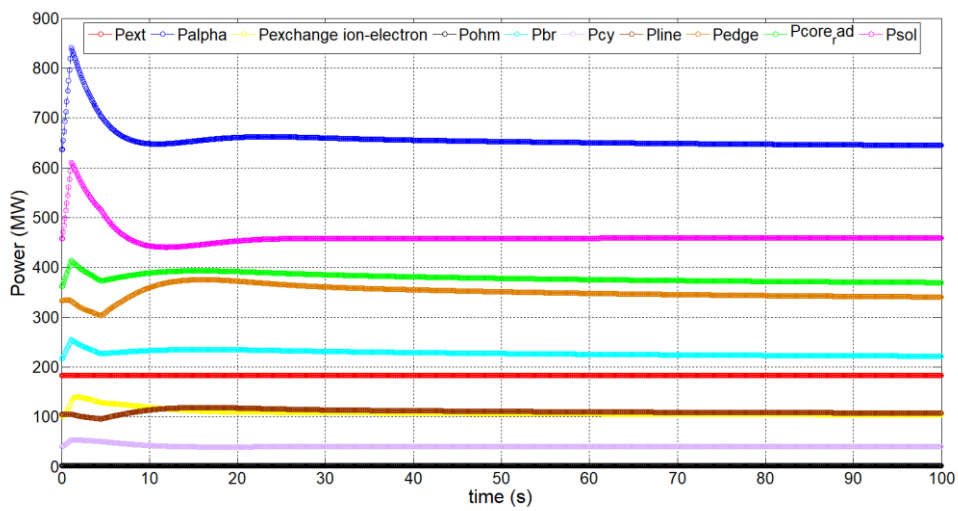


Figure 552: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s) Powers graphic.

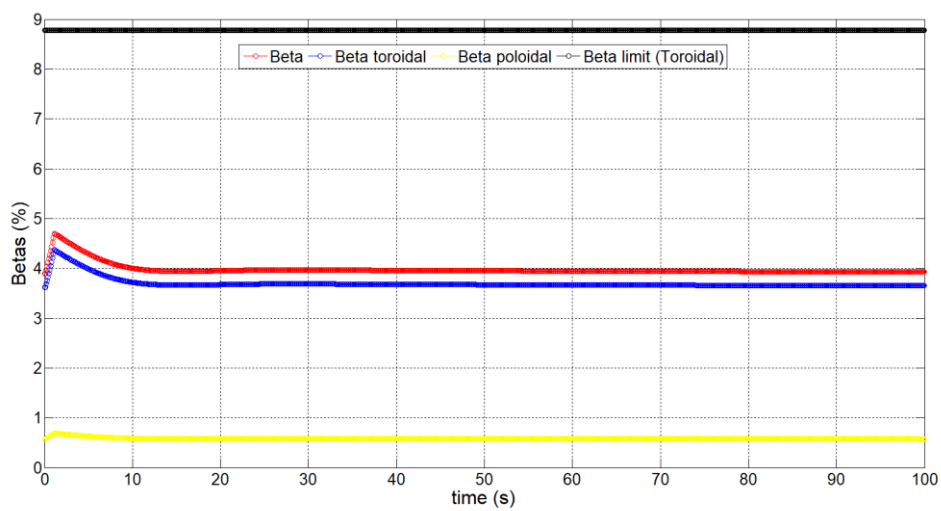


Figure 553: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s) Betas graphic.

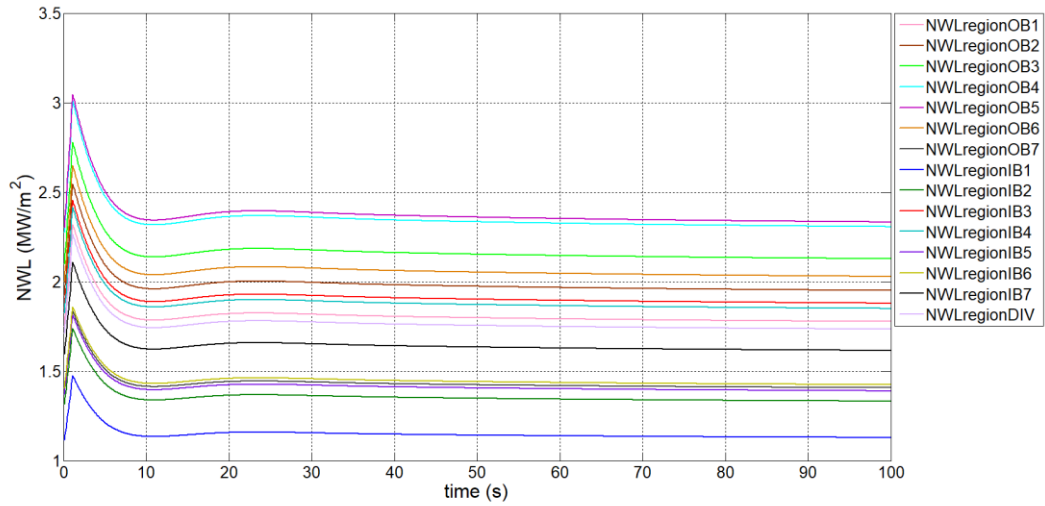


Figure 554: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s) NWL graphic.

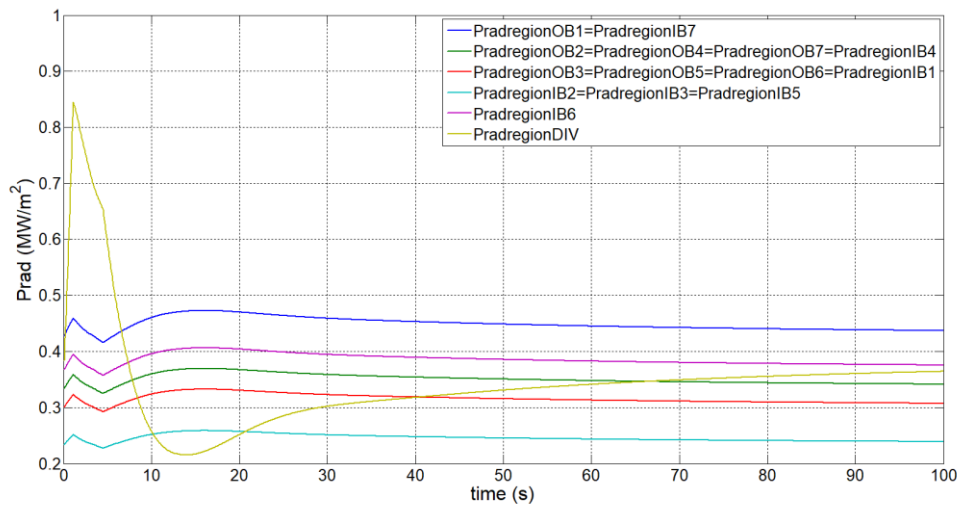


Figure 555: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s)  $P_{rad}$  graphic.

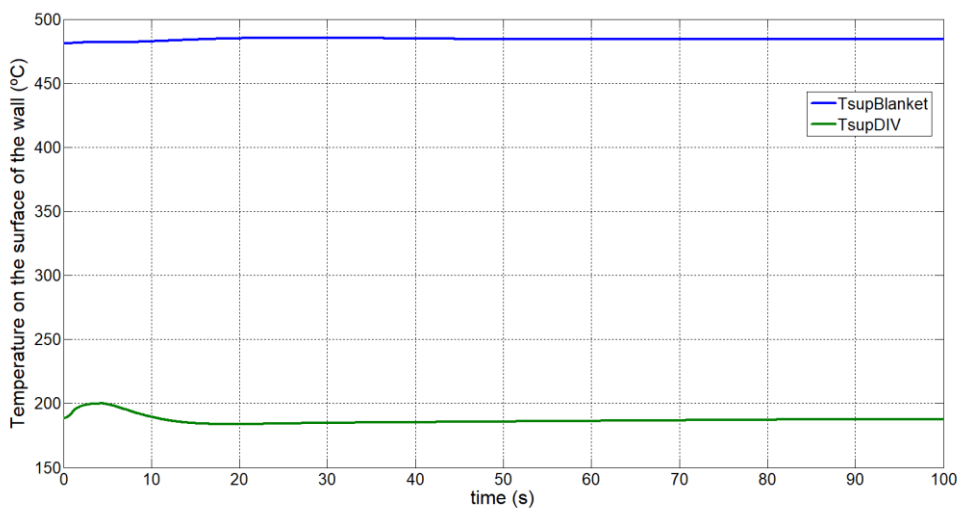


Figure 556: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s) Temperature on the surface of the blanket and divertor wall graphic.

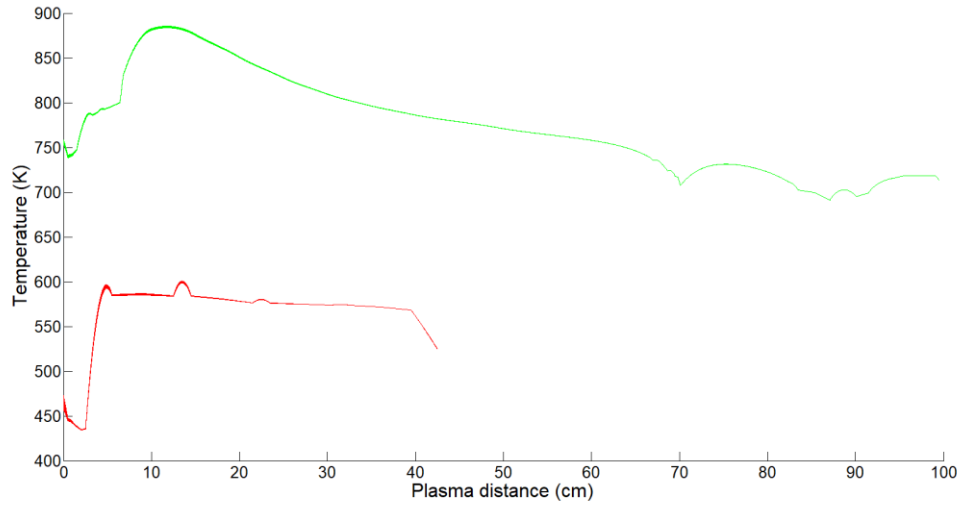


Figure 557: HCLL DEMO2 Occasional confinement time improvement x3 (during 1s) evolution of the BB and divertor temperature graphic.

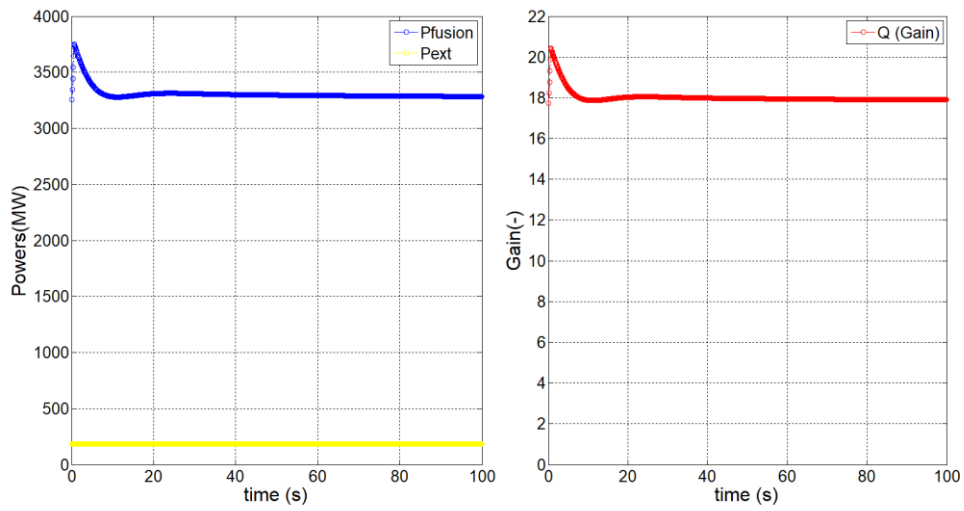


Figure 558: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s)  $P_{fus}$  and gain graphic.

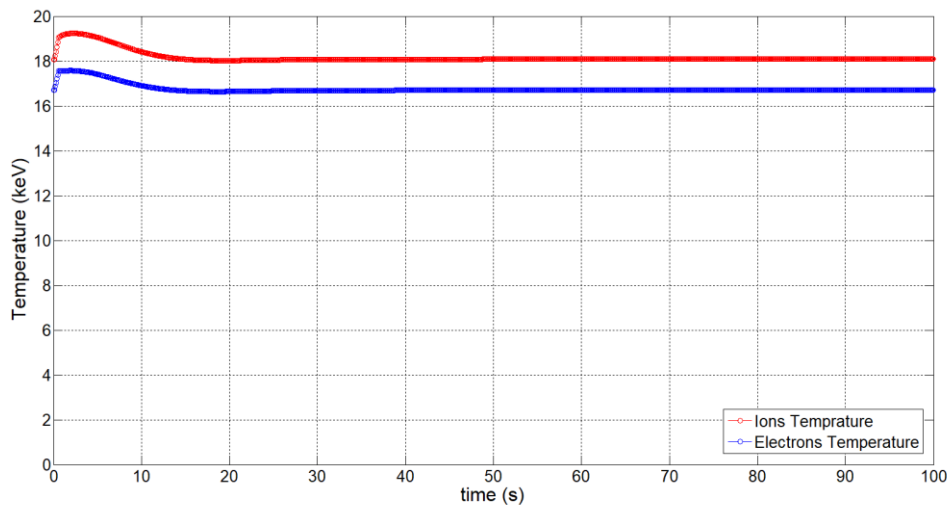


Figure 559: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s) Temperatures graphic.

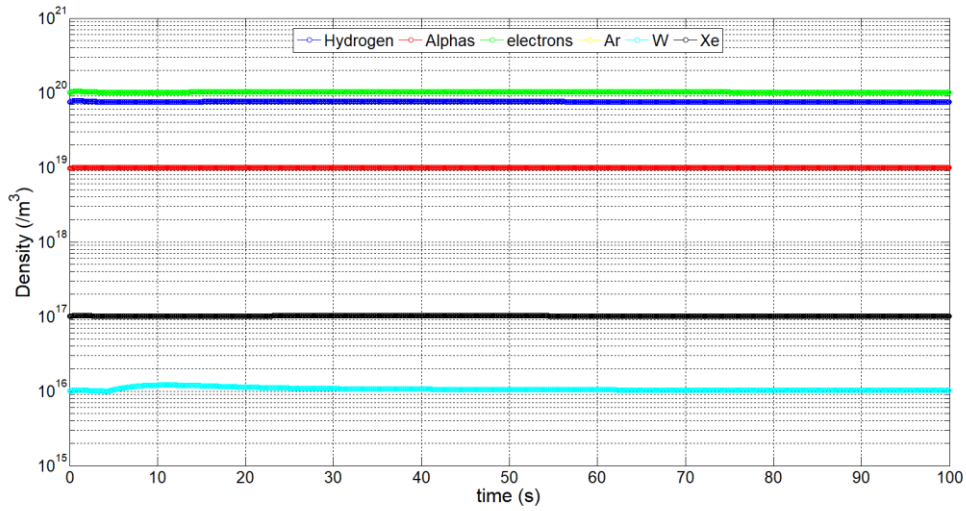


Figure 560: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s) Densities graphic.

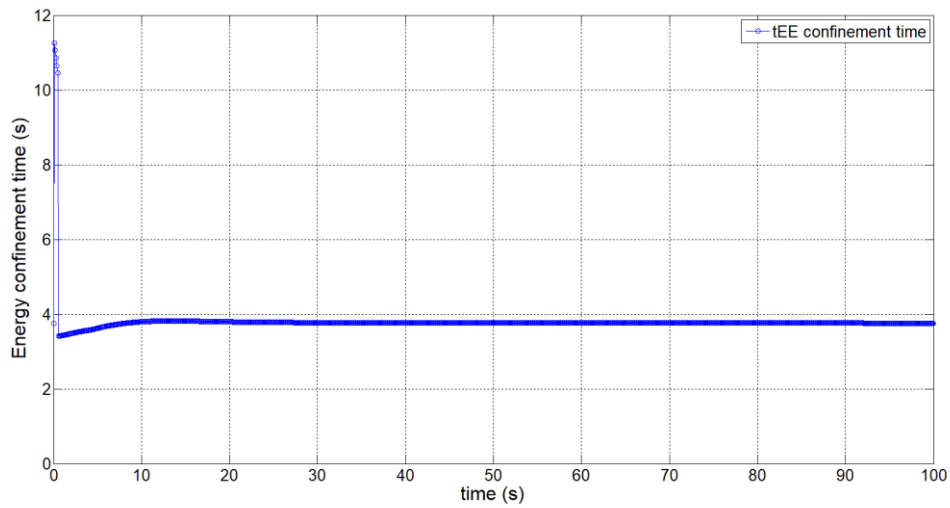


Figure 561: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s) Confinement time graphic.

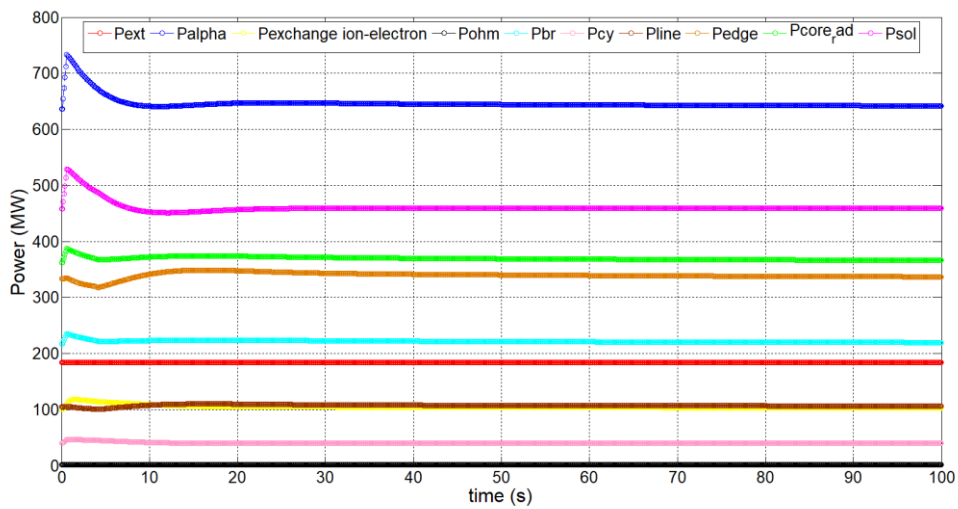


Figure 562: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s) Powers graphic.

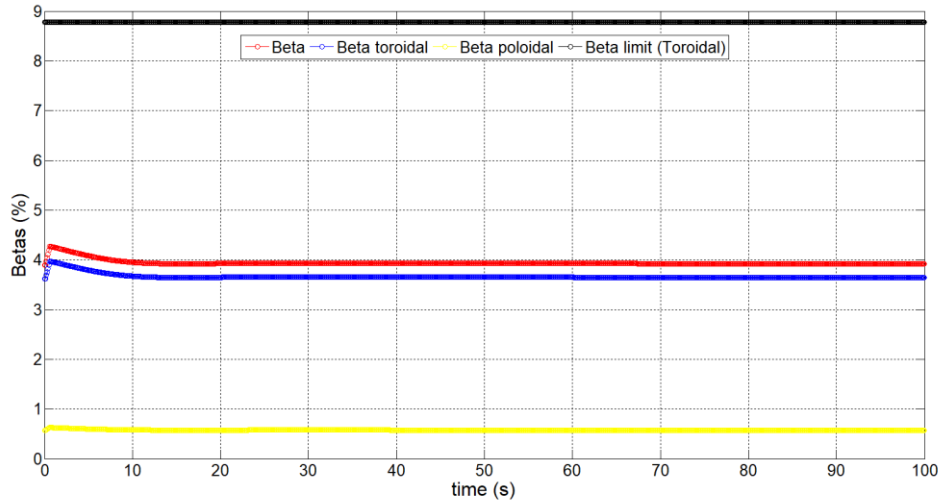


Figure 563: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s) Betas graphic.

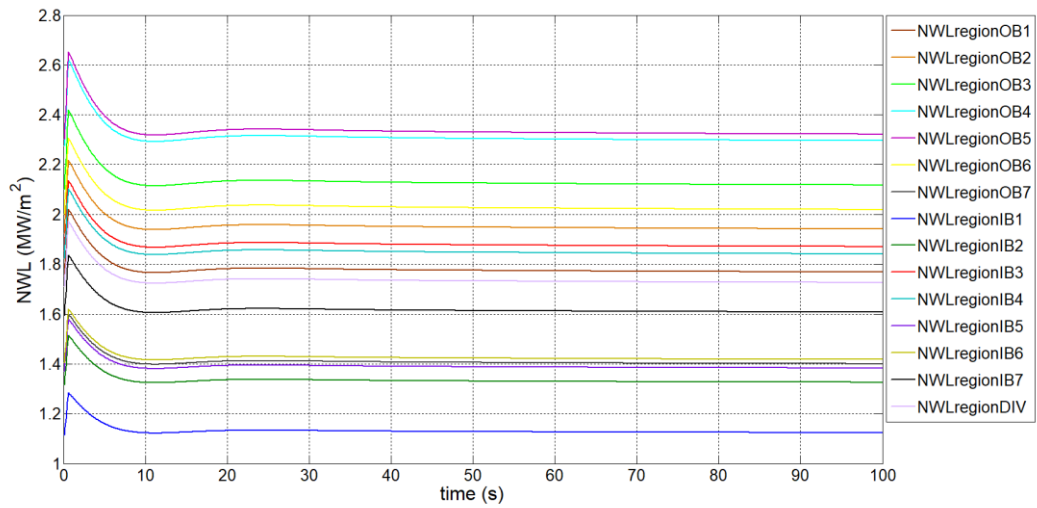


Figure 564: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s) NWL graphic.

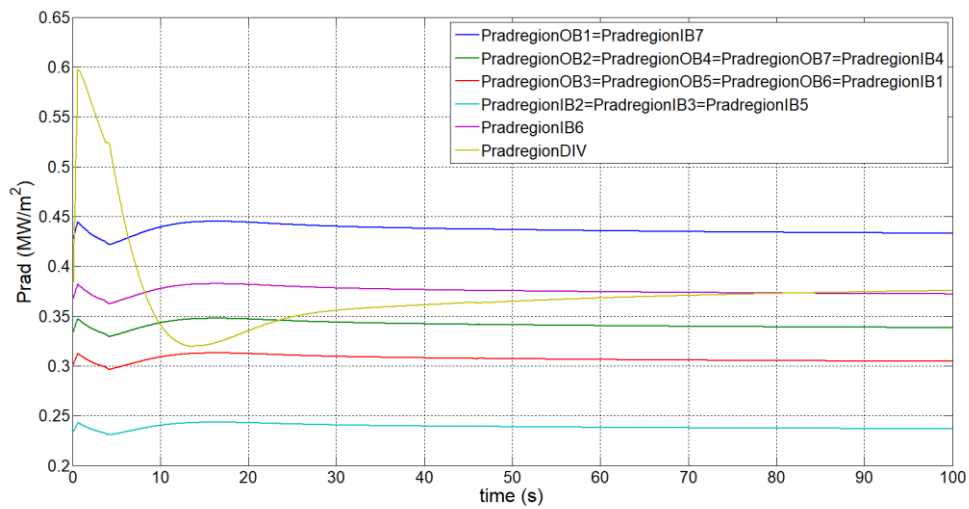


Figure 565: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s)  $P_{rad}$  graphic.

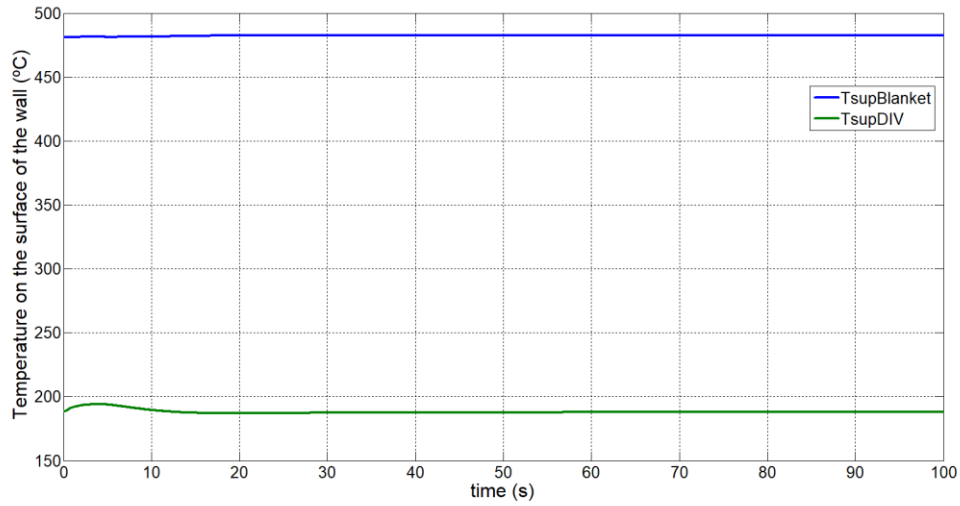


Figure 566: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s) Temperature on the surface of the blanket and divertor wall graphic.

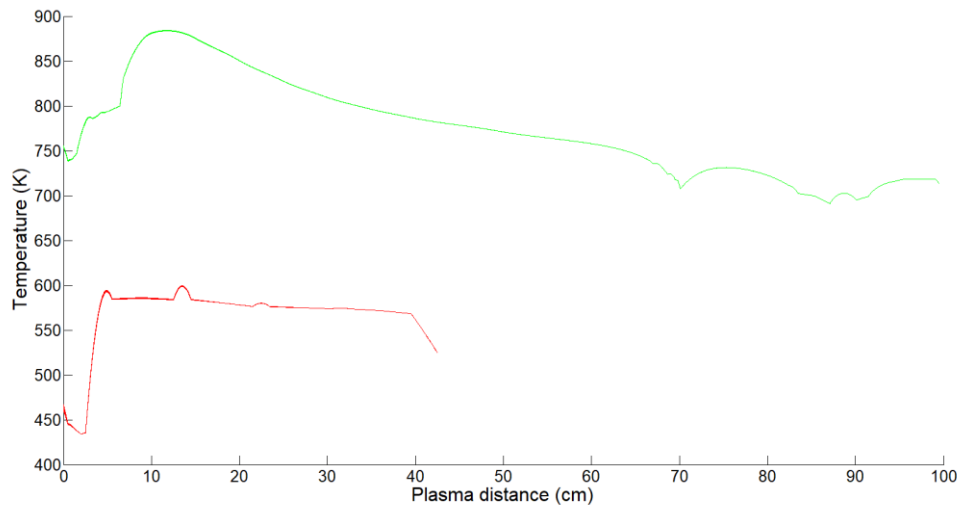


Figure 567: HCLL DEMO2 Occasional confinement time improvement x3 (during 0.5s) evolution of the BB and divertor temperature graphic.

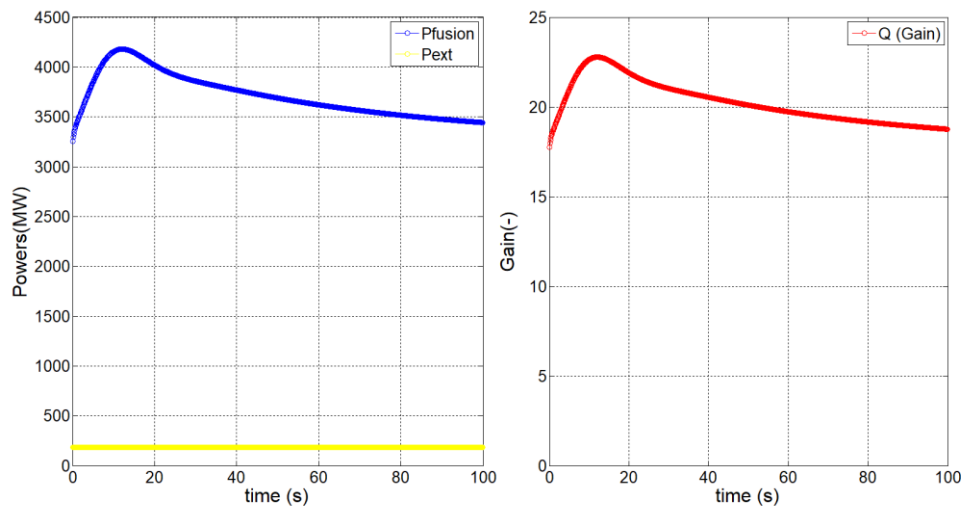


Figure 568: HCLL DEMO2 Punctual impurities entrance x1.5  $P_{fus}$  and gain graphic.



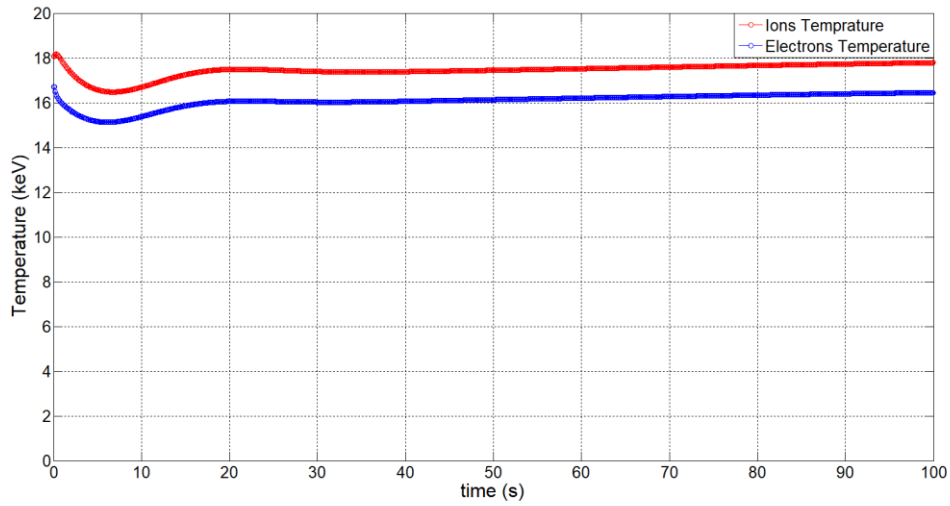


Figure 569: HCLL DEMO2 Punctual impurities entrance x1.5 Temperatures graphic.

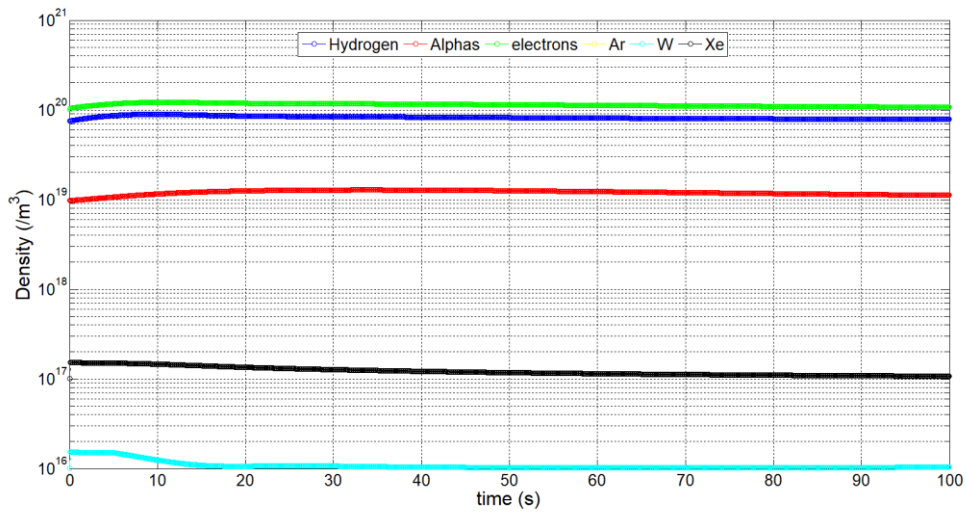


Figure 570: HCLL DEMO2 Punctual impurities entrance x1.5 Densities graphic.

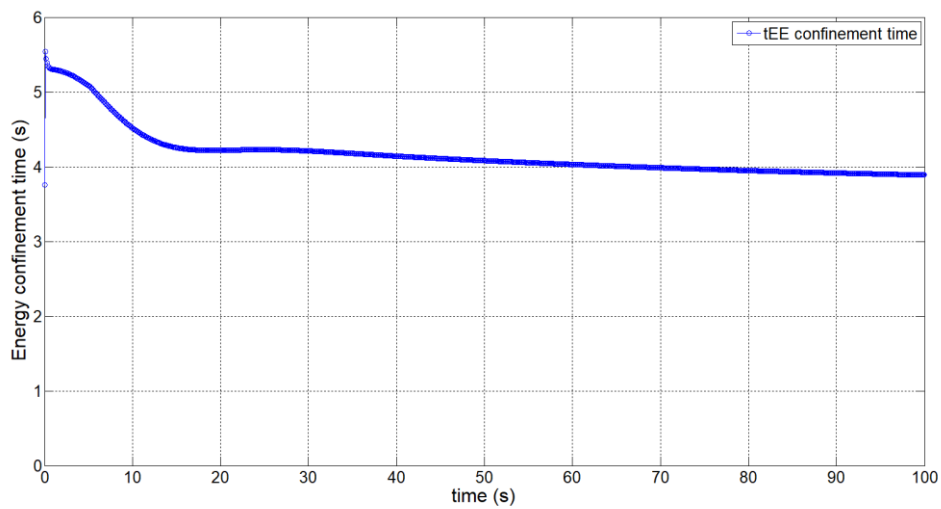


Figure 571: HCLL DEMO2 Punctual impurities entrance x1.5 Confinement time graphic.

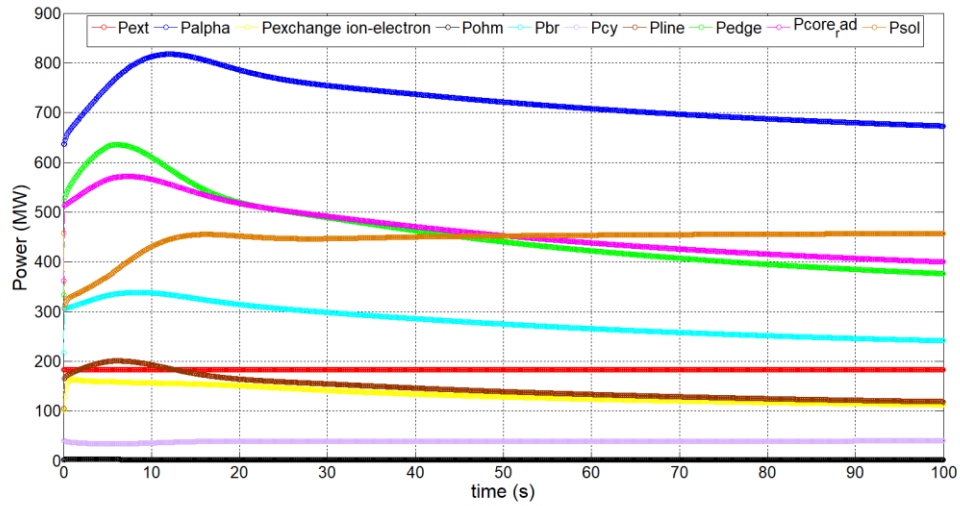


Figure 572: HCLL DEMO2 Punctual impurities entrance x1.5 Powers graphic.

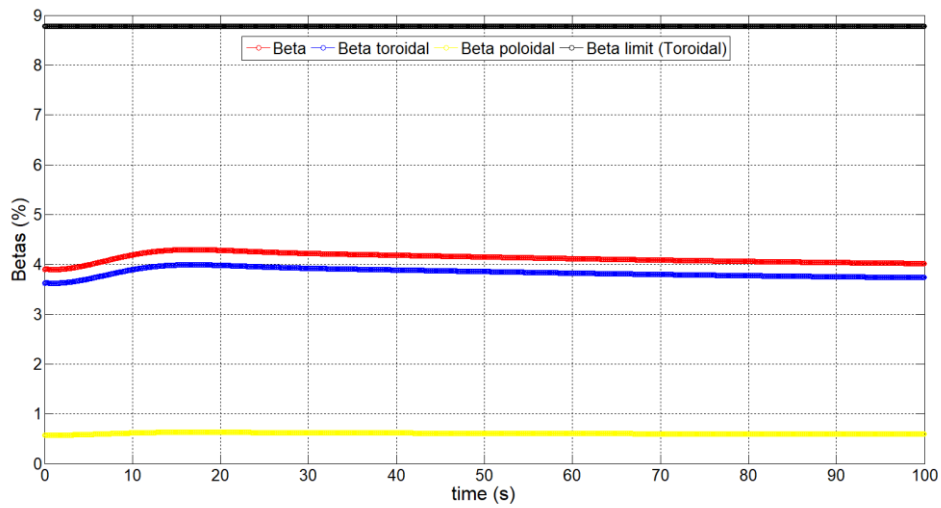


Figure 573: HCLL DEMO2 Punctual impurities entrance x1.5 Betas graphic.

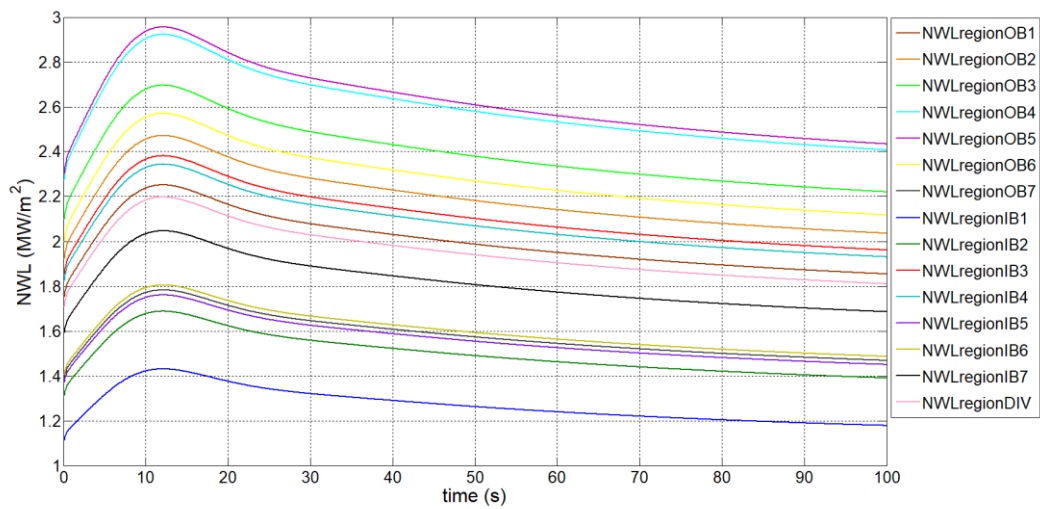


Figure 574: HCLL DEMO2 Punctual impurities entrance x1.5 NWL graphic.

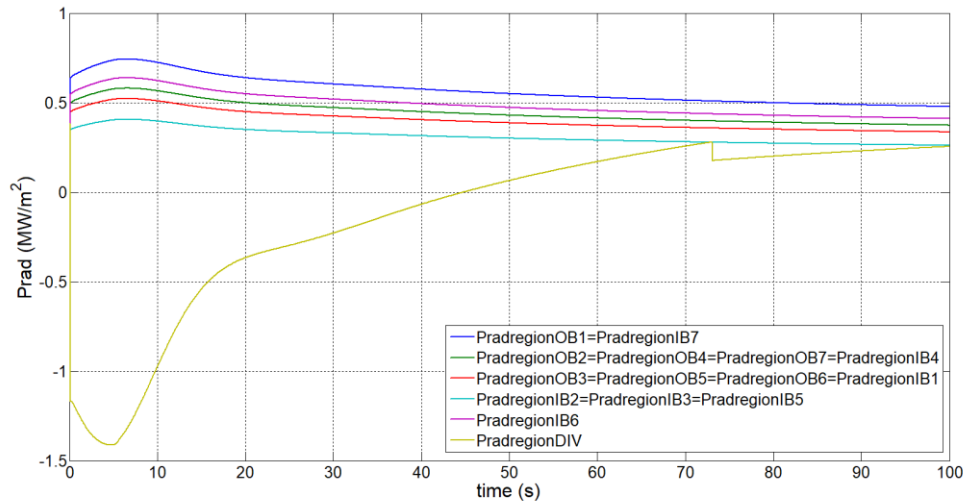


Figure 575: HCLL DEMO2 Punctual impurities entrance x1.5  $P_{rad}$  graphic.

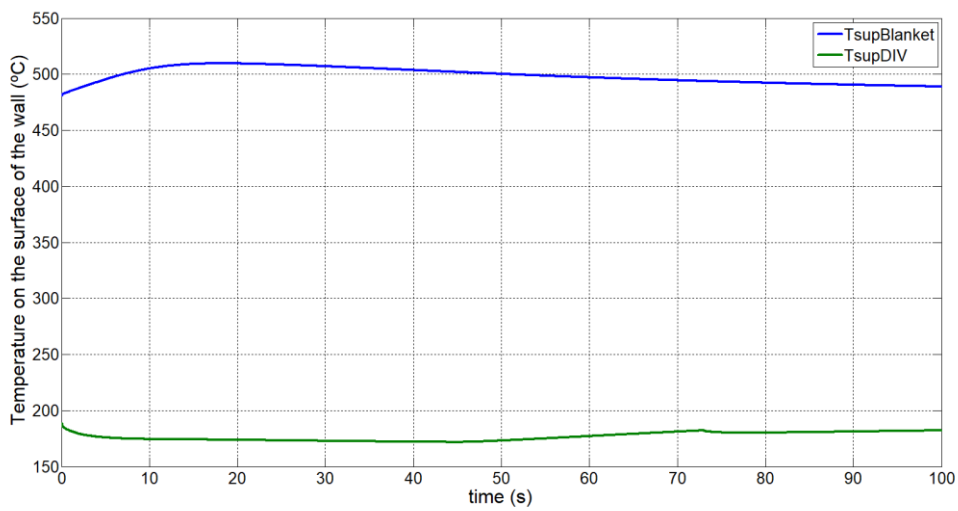


Figure 576: HCLL DEMO2 Punctual impurities entrance x1.5 Temperature on the surface of the blanket and divertor wall graphic.

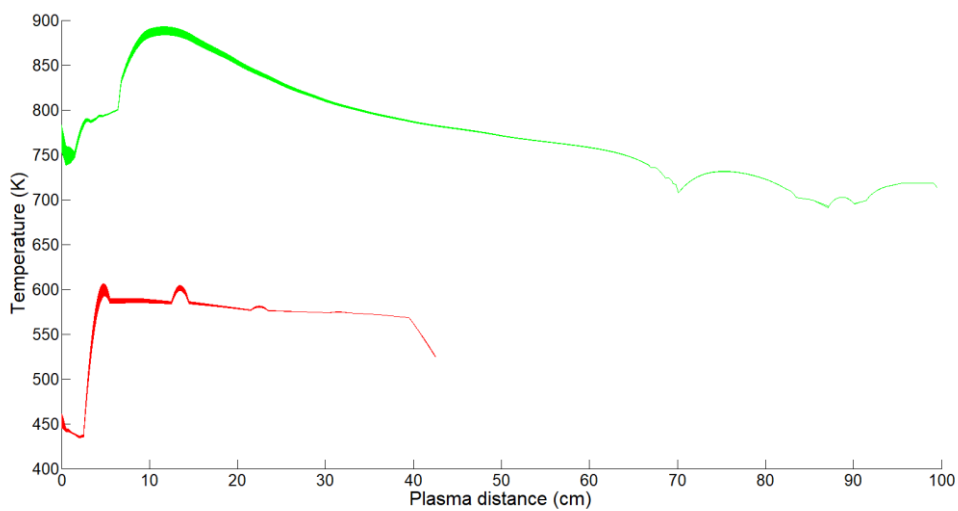


Figure 577: HCLL DEMO2 Punctual impurities entrance x1.5 evolution of the BB and divertor temperature graphic.

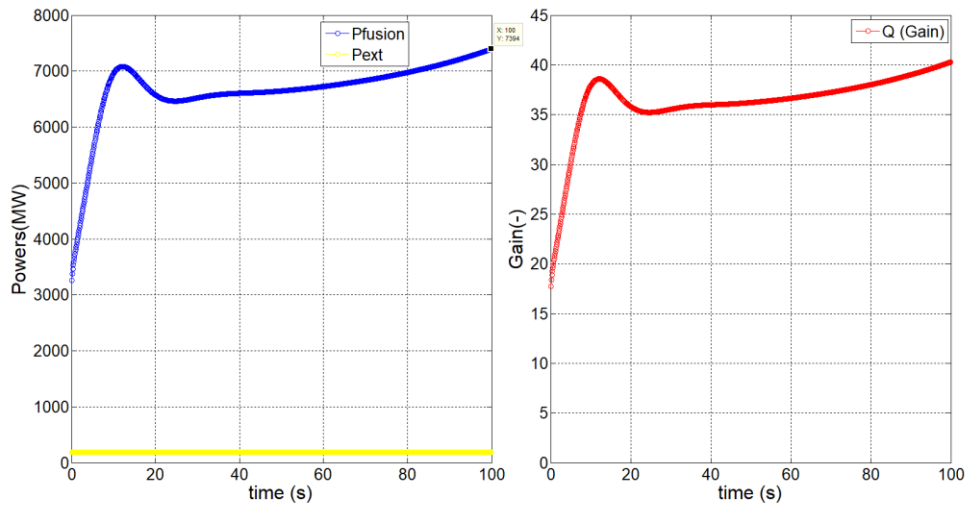


Figure 578: HCLL DEMO2 Punctual impurities entrance x2  $P_{fus}$  and gain graphic.

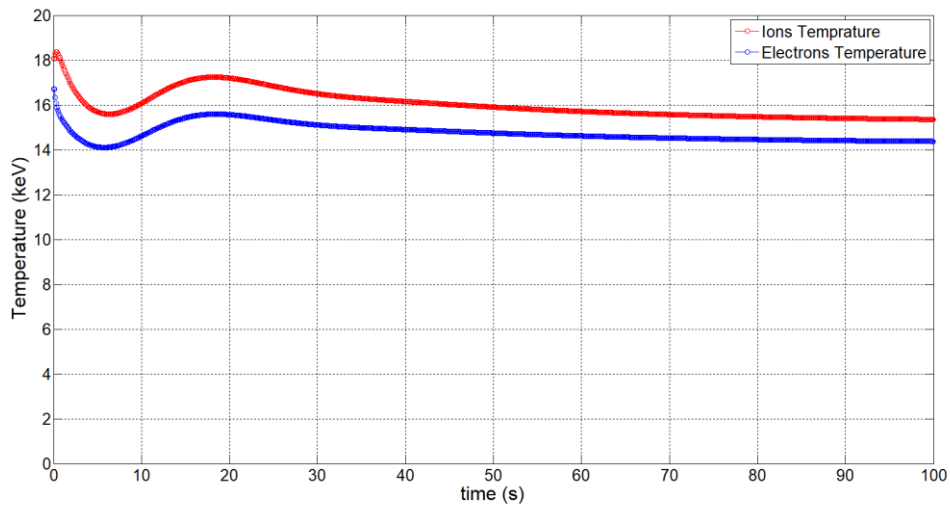


Figure 579: HCLL DEMO2 Punctual impurities entrance x2 Temperatures graphic.

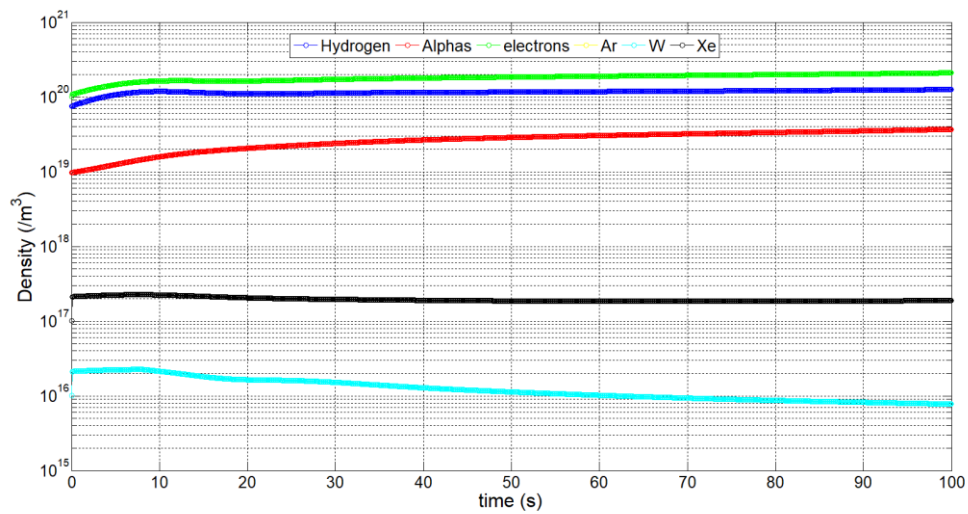


Figure 580: HCLL DEMO2 Punctual impurities entrance x2 Densities graphic.

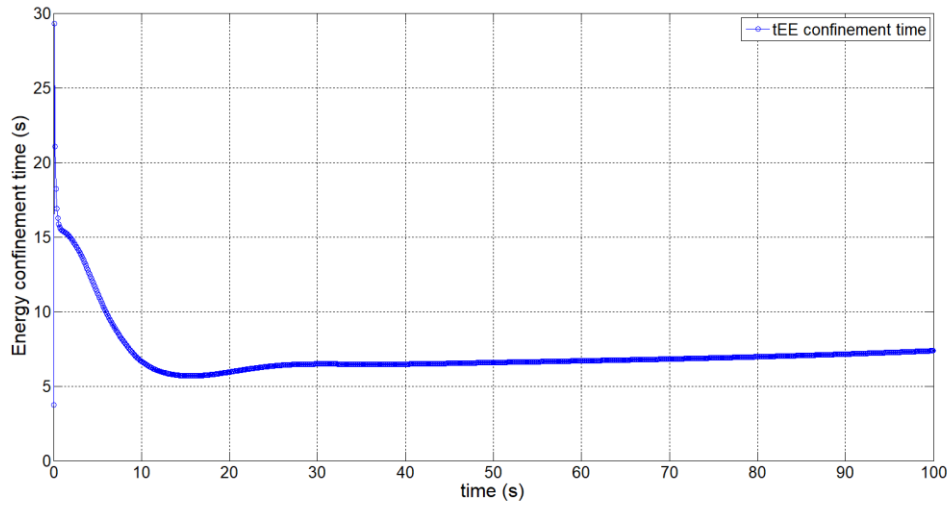


Figure 581: HCLL DEMO2 Punctual impurities entrance x2 Confinement time graphic.

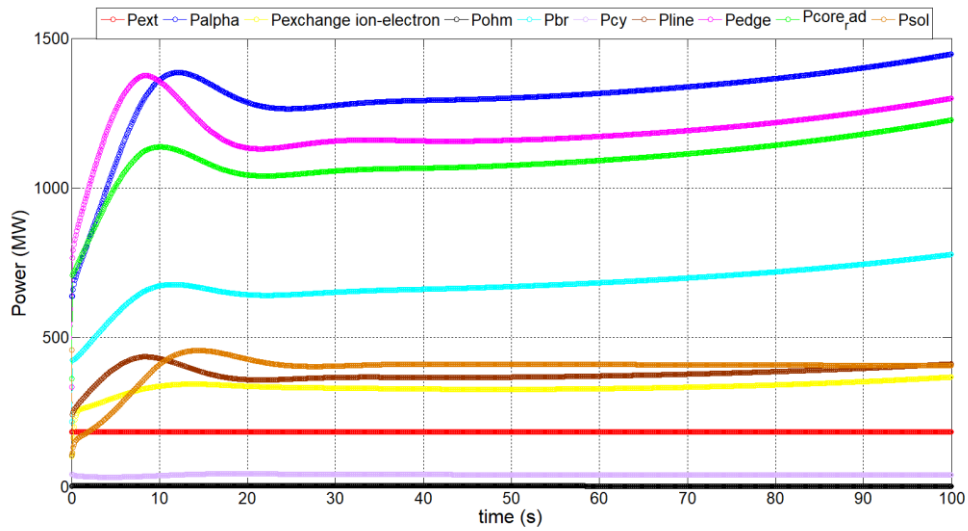


Figure 582: HCLL DEMO2 Punctual impurities entrance x2 Powers graphic.

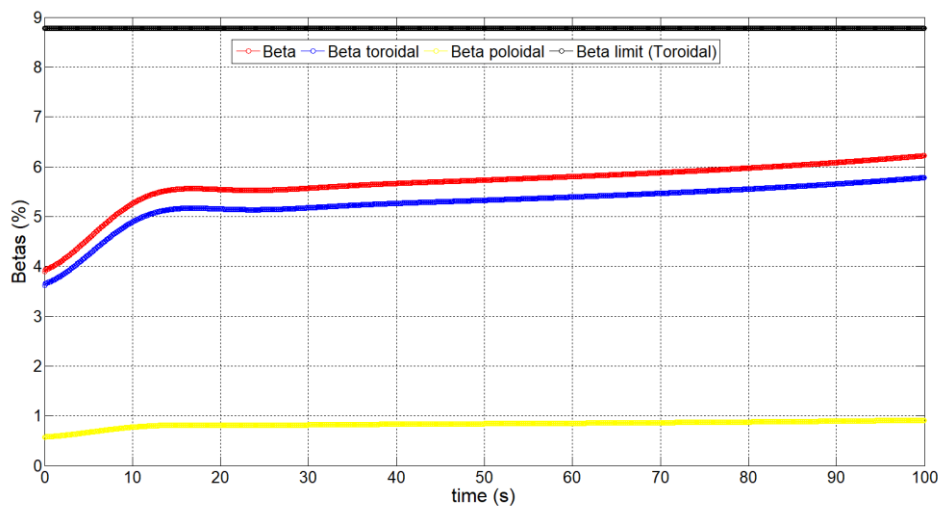


Figure 583: HCLL DEMO2 Punctual impurities entrance x2 Betas graphic.

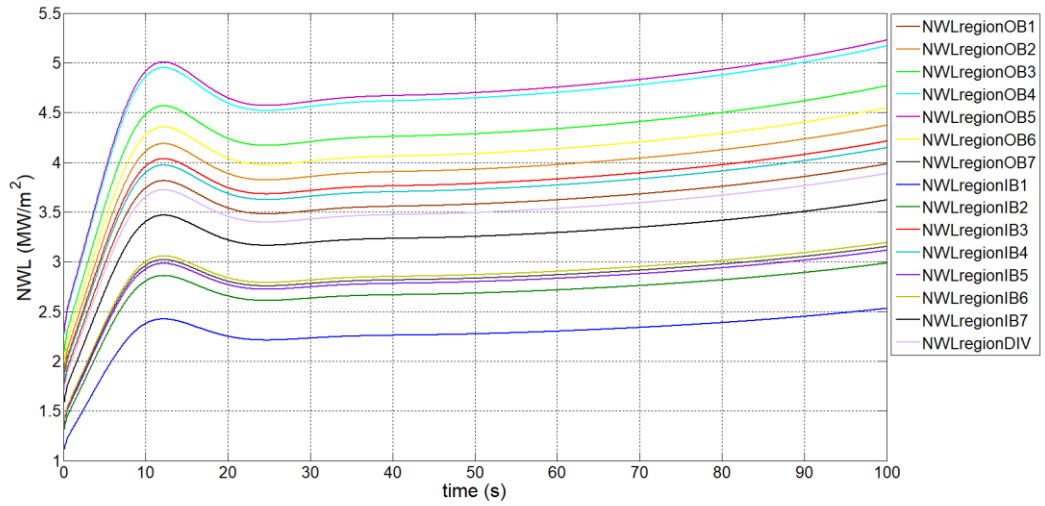


Figure 584: HCLL DEMO2 Punctual impurities entrance x2 NWL graphic.

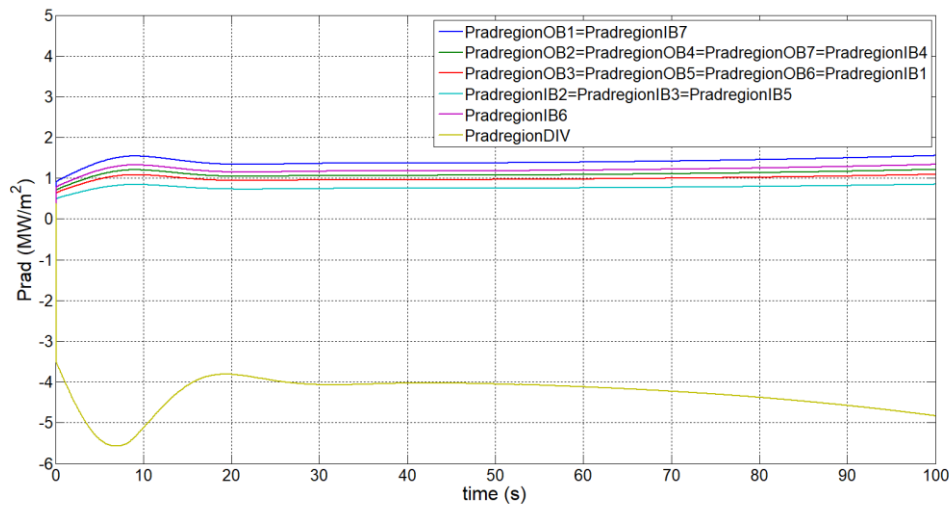


Figure 585: HCLL DEMO2 Punctual impurities entrance x2  $P_{rad}$  graphic.

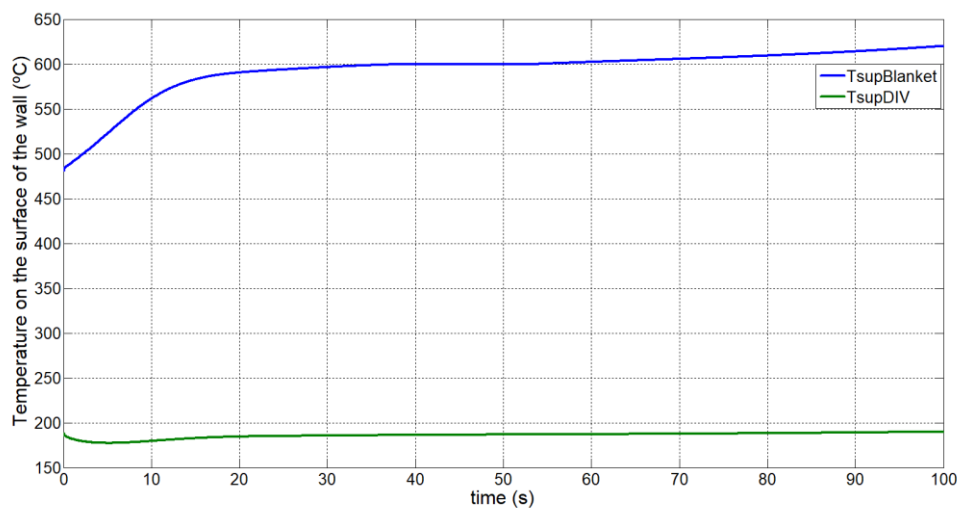


Figure 586: HCLL DEMO2 Punctual impurities entrance x2 Temperature on the surface of the blanket and divertor wall graphic.

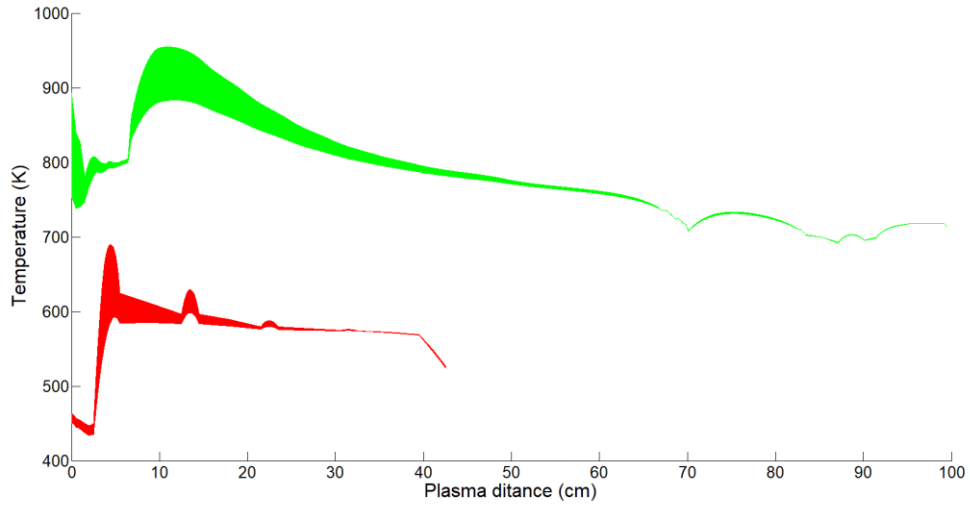


Figure 587: HCLL DEMO2 Punctual impurities entrance x2 evolution of the BB and divertor temperature graphic.

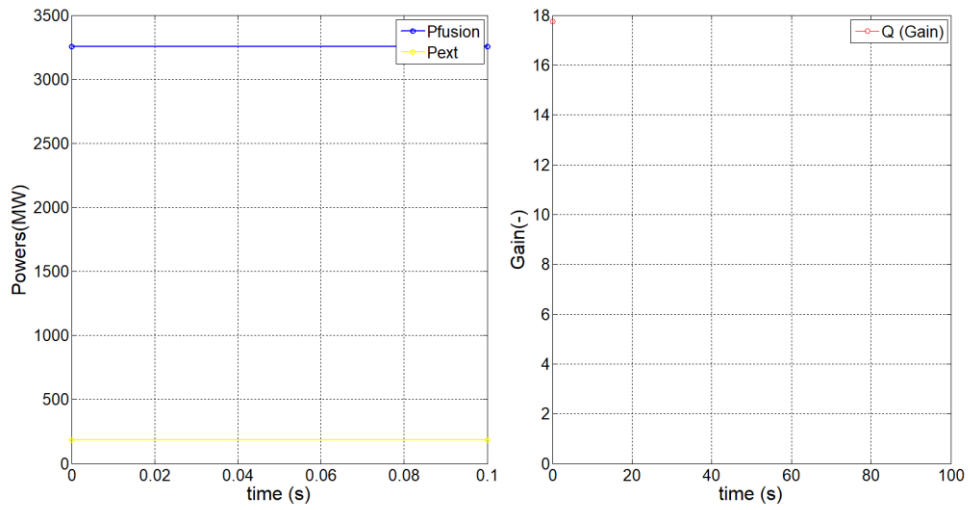


Figure 588: HCLL DEMO2 Punctual impurities entrance x3  $P_{fus}$  and gain graphic.

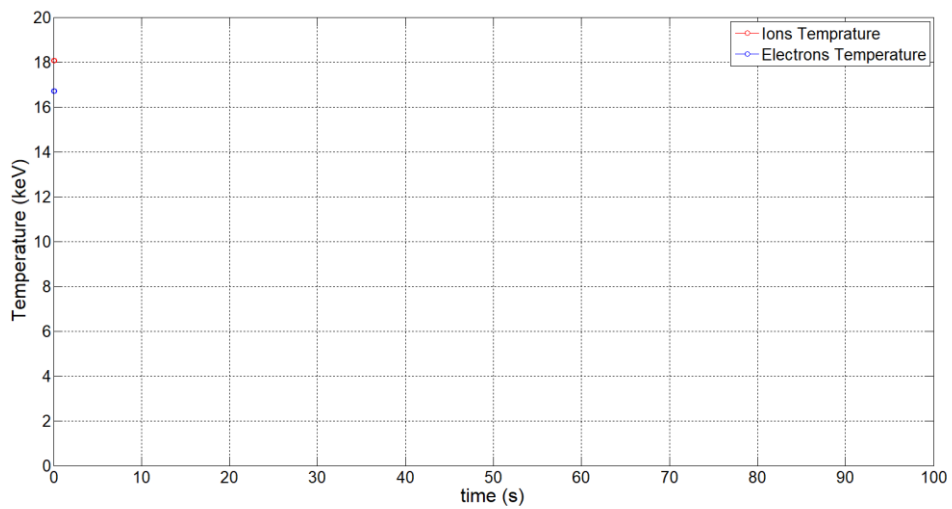


Figure 589: HCLL DEMO2 Punctual impurities entrance x3 Temperatures graphic.

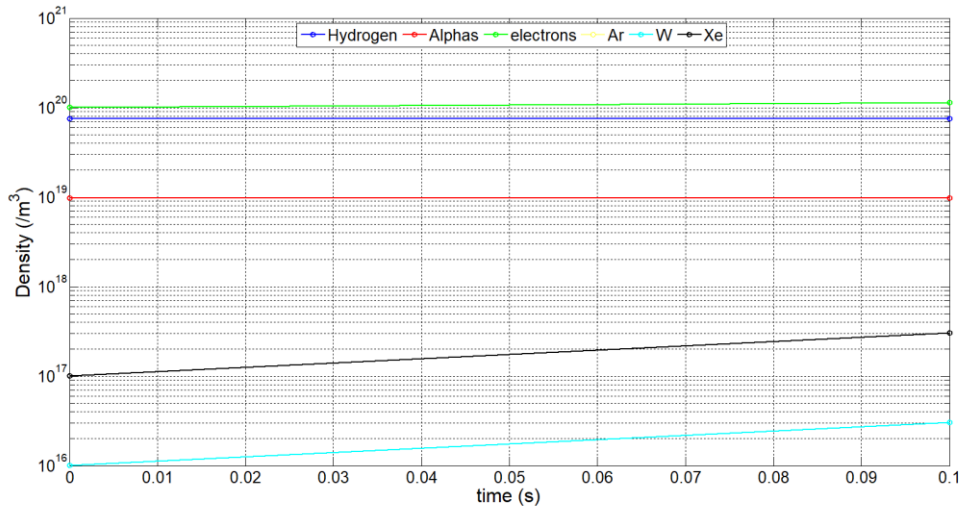


Figure 590: HCLL DEMO2 Punctual impurities entrance x3 Densities graphic.

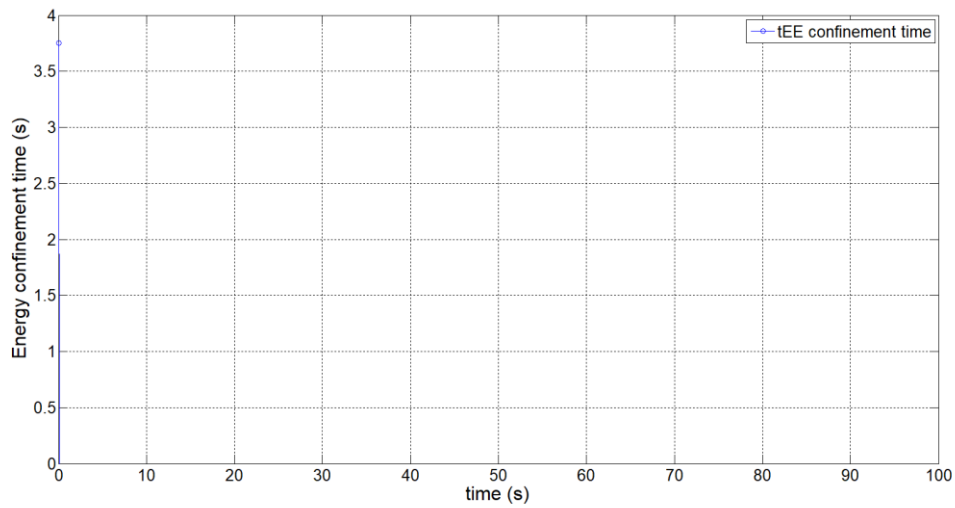


Figure 591: HCLL DEMO2 Punctual impurities entrance x3 Confinement time graphic.

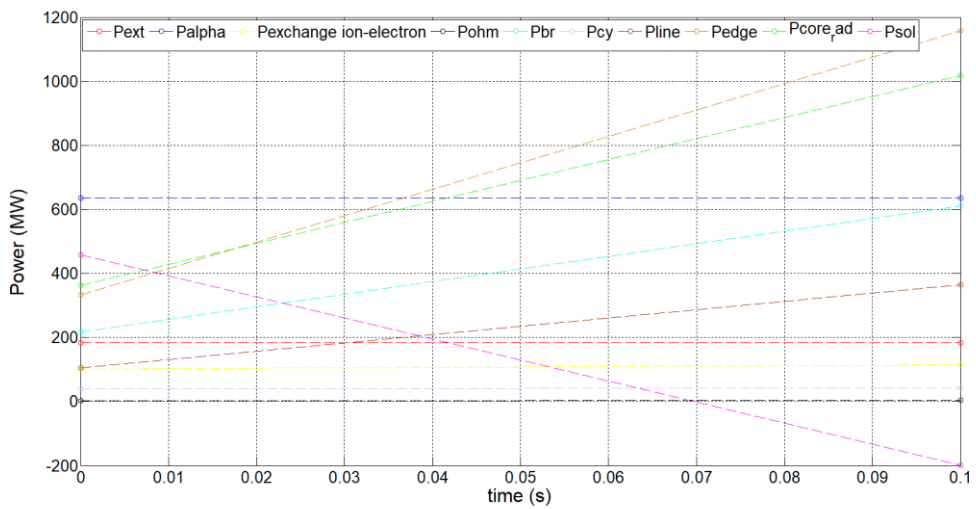


Figure 592: HCLL DEMO2 Punctual impurities entrance x3 Powers graphic.



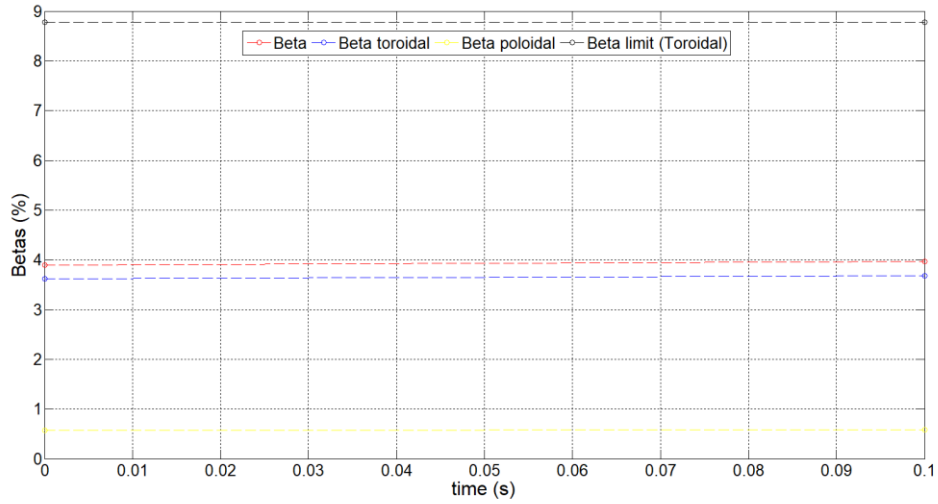


Figure 593: HCLL DEMO2 Punctual impurities entrance x3 Betas graphic.

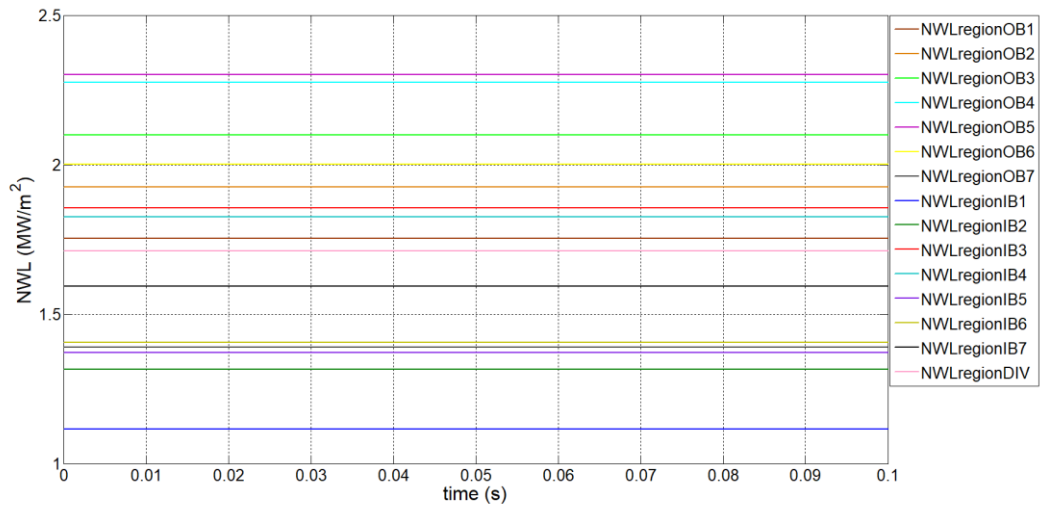


Figure 594: HCLL DEMO2 Punctual impurities entrance x3 NWL graphic.

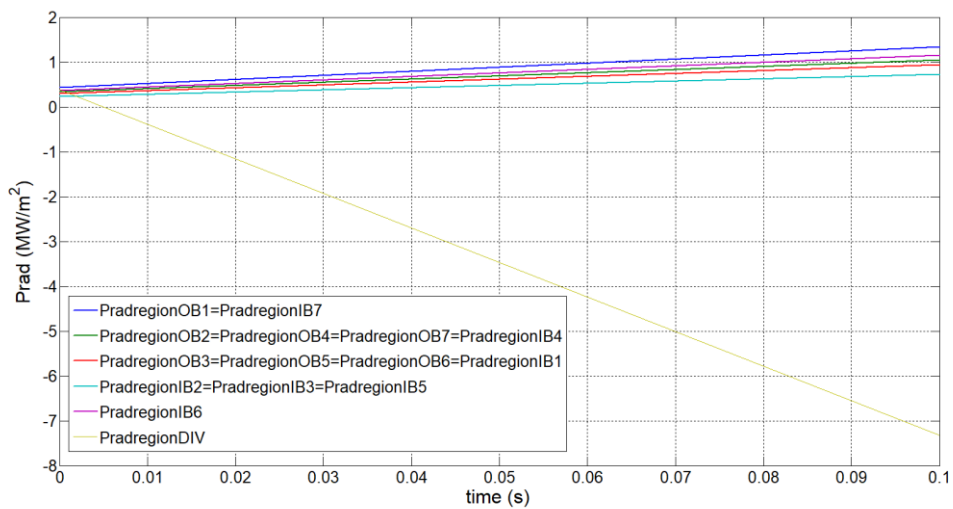


Figure 595: HCLL DEMO2 Punctual impurities entrance x3  $P_{rad}$  graphic.

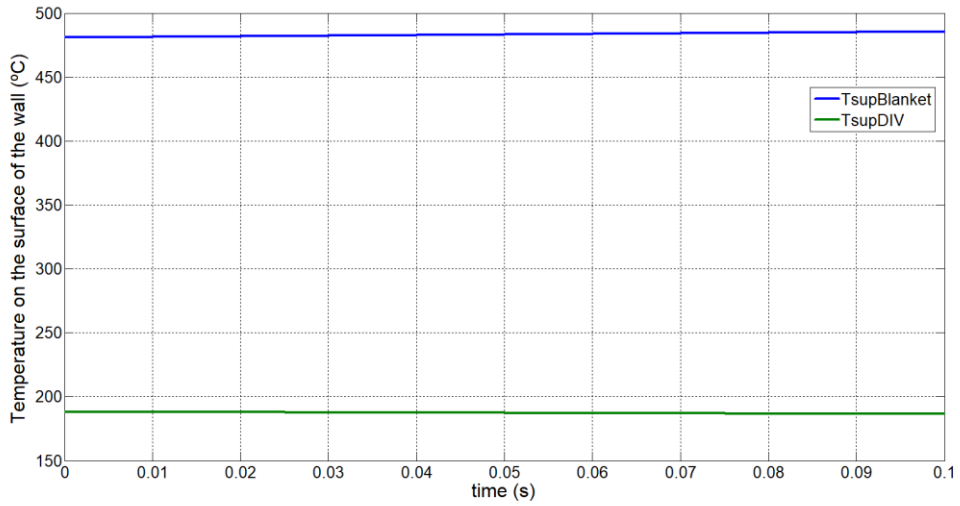


Figure 596: HCLL DEMO2 Punctual impurities entrance x3 Temperature on the surface of the blanket and divertor wall graphic.

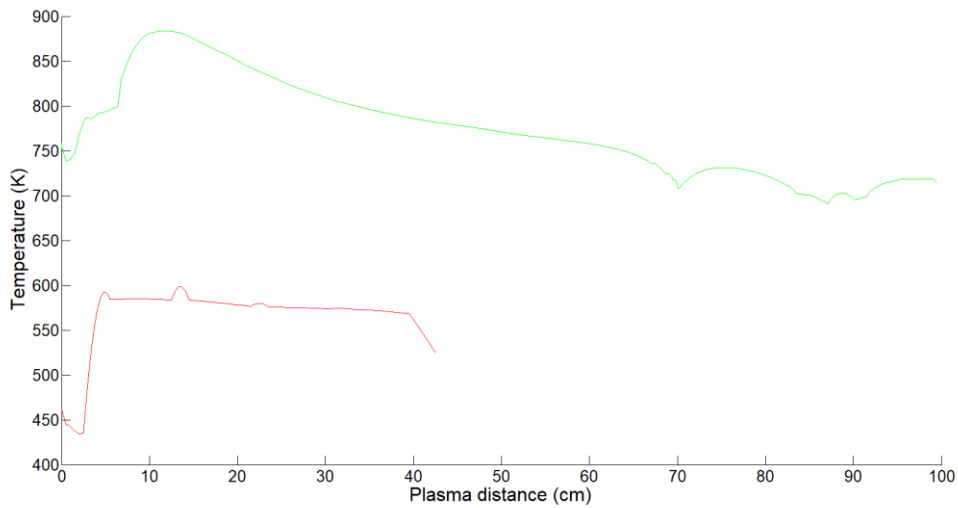


Figure 597: HCLL DEMO2 Punctual impurities entrance x3 evolution of the BB and divertor temperature graphic.

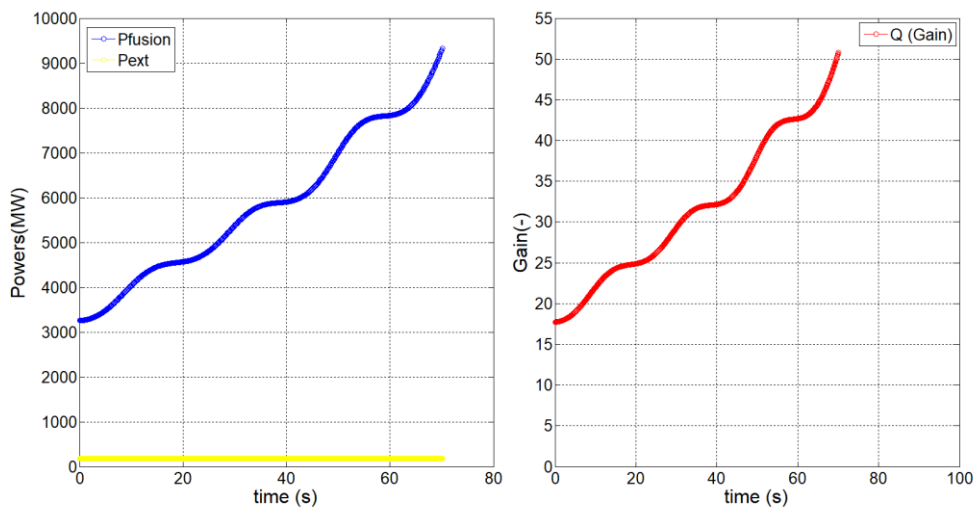


Figure 598: HCLL DEMO2 Tungsten permanent entrance x10  $P_{fus}$  and gain graphic.

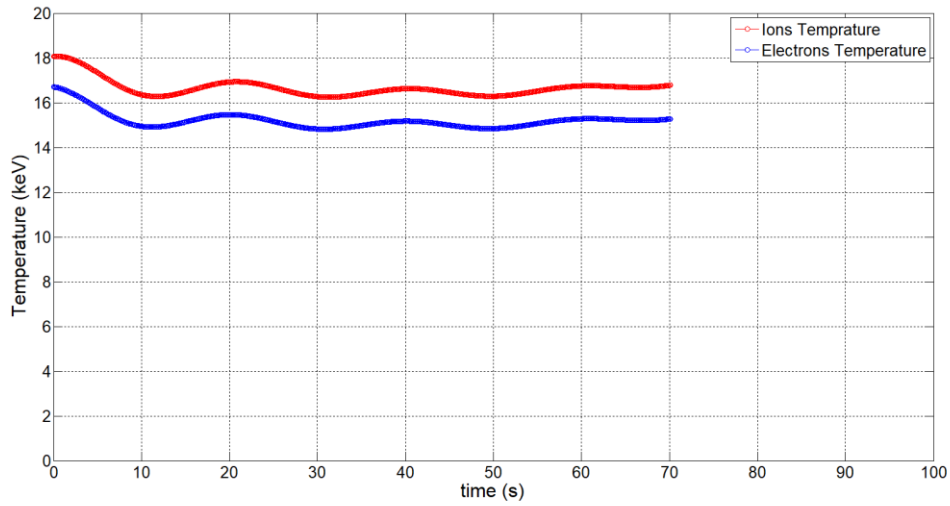


Figure 599: HCLL DEMO2 Tungsten permanent entrance x10 Temperatures graphic.

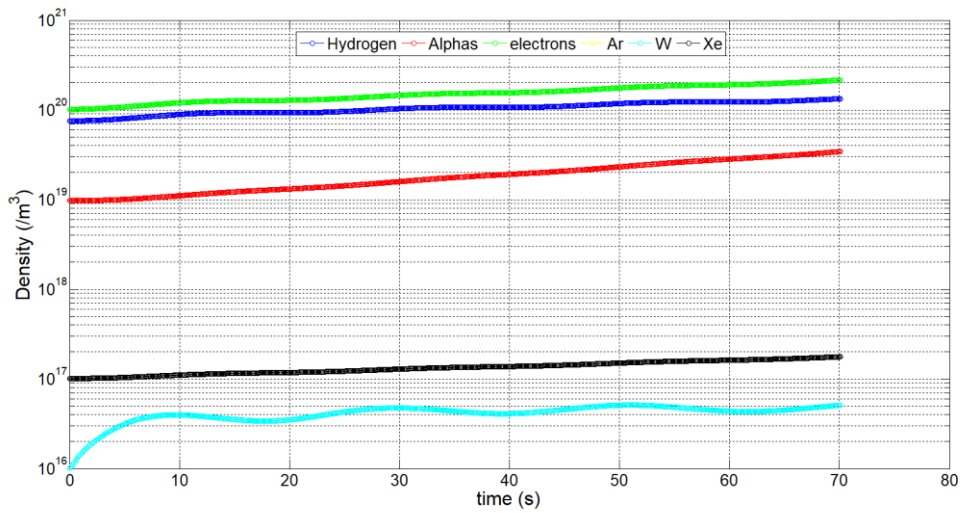


Figure 600: HCLL DEMO2 Tungsten permanent entrance x10 Densities graphic.

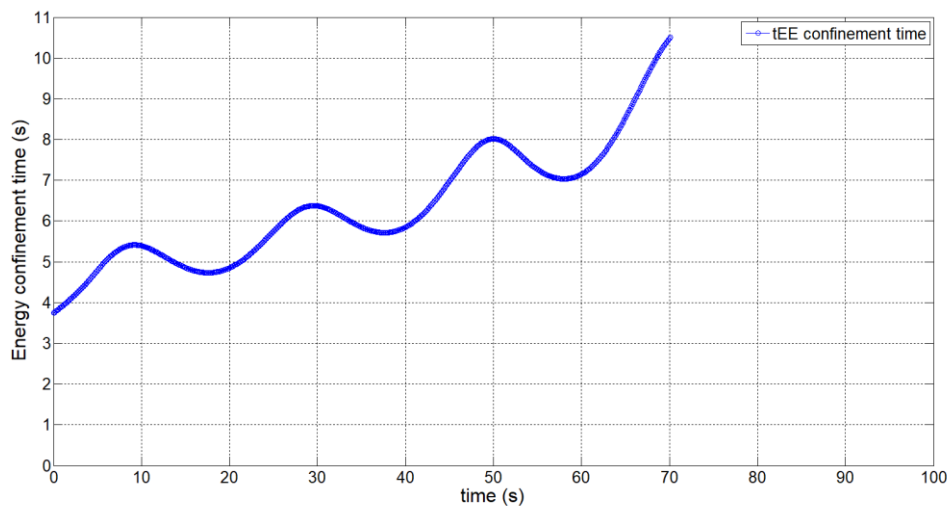


Figure 601: HCLL DEMO2 Tungsten permanent entrance x10 Confinement time graphic.

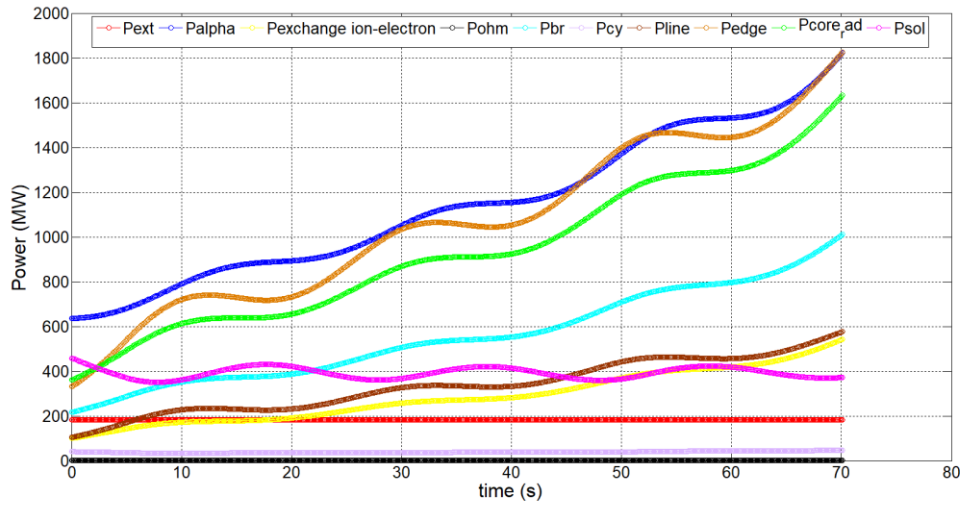


Figure 602: HCLL DEMO2 Tungsten permanent entrance x10 Powers graphic.

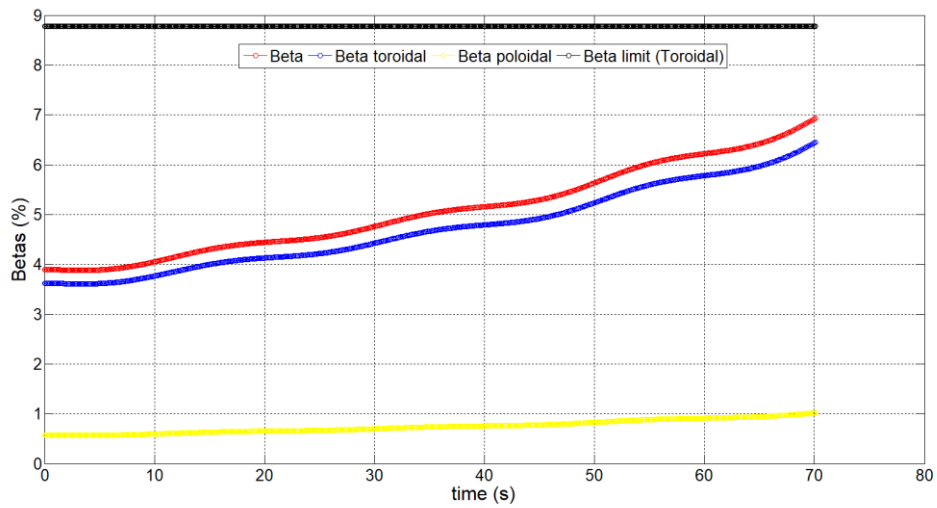


Figure 603: HCLL DEMO2 Tungsten permanent entrance x10 Betas graphic.

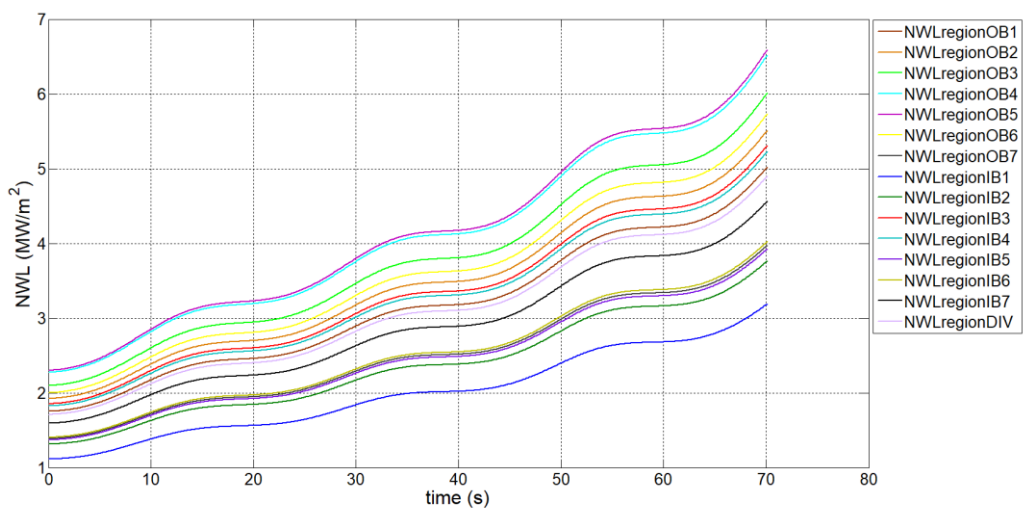


Figure 604: HCLL DEMO2 Tungsten permanent entrance x10 NWL graphic.

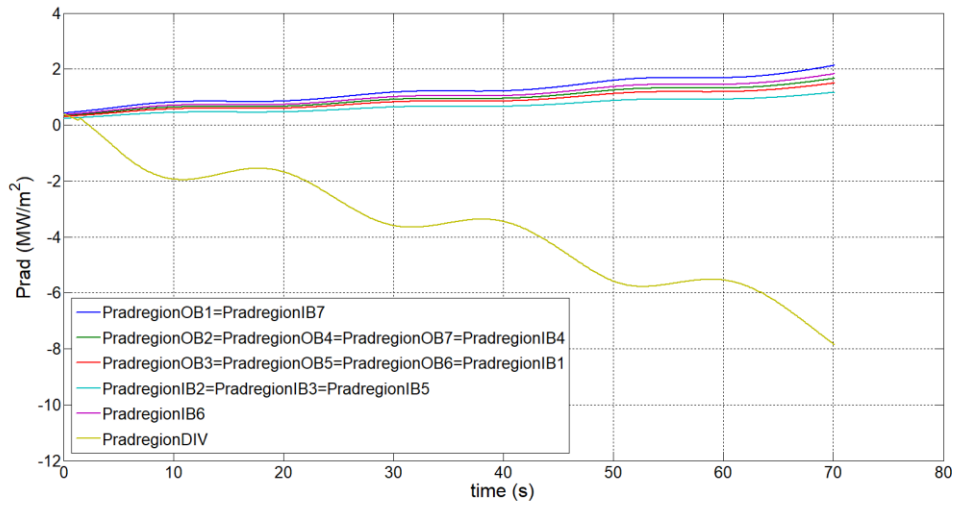


Figure 605: HCLL DEMO2 Tungsten permanent entrance x10  $P_{rad}$  graphic.

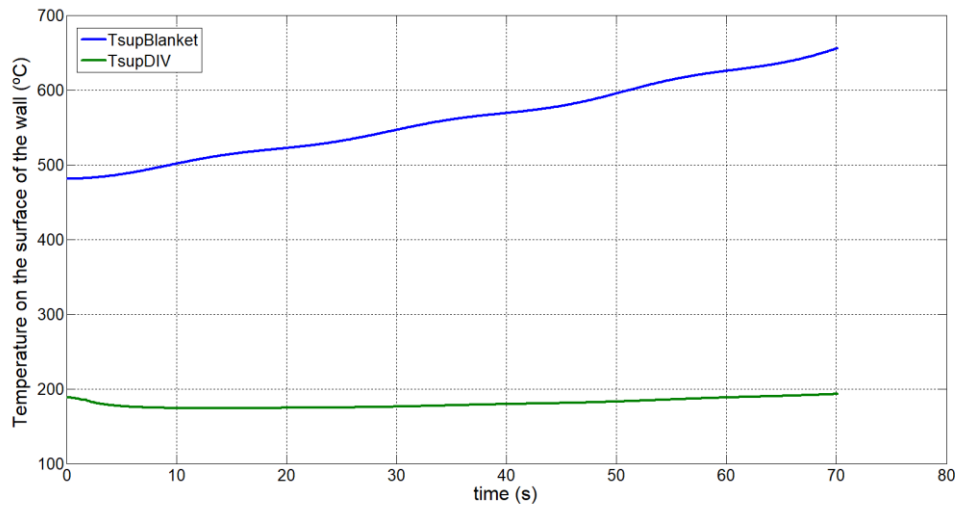


Figure 606: HCLL DEMO2 Tungsten permanent entrance x10 Temperature on the surface of the blanket and divertor wall graphic.

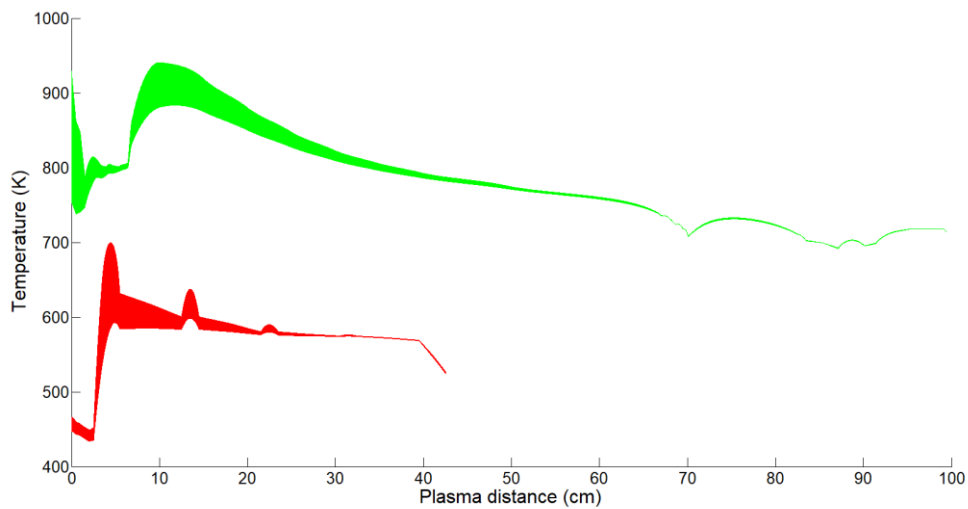


Figure 607: HCLL DEMO2 Tungsten permanent entrance x10 evolution of the BB and divertor temperature graphic.

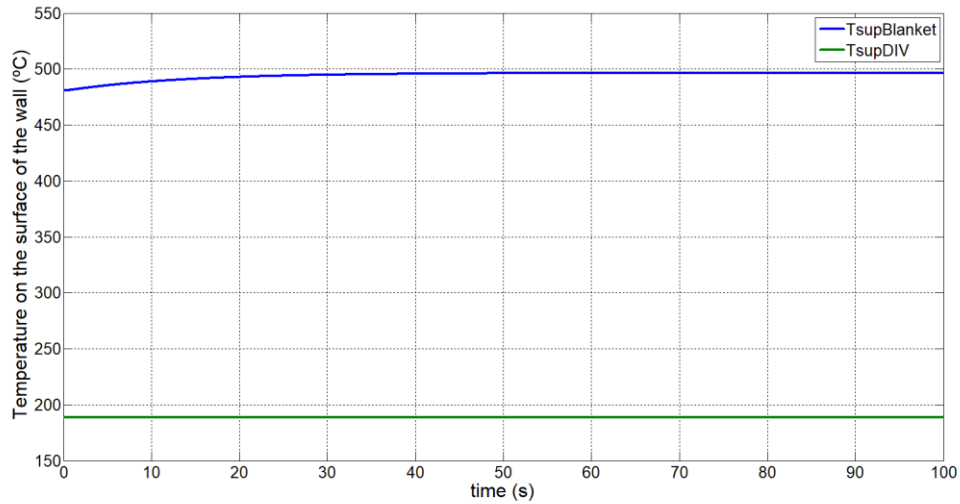


Figure 608: HCLL DEMO2 BB LOCA 30% in all the cooling loops (FW and internal channels). Temperature on the surface of the blanket and divertor wall graphic.

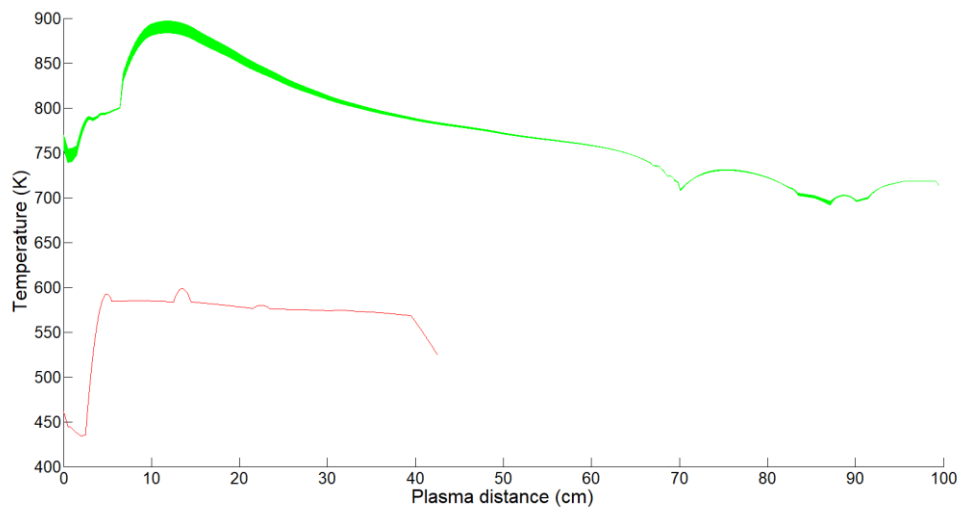


Figure 609: HCLL DEMO2 BB LOCA 30% in all the cooling loops (FW and internal channels). Evolution of the BB and divertor temperature graphic.

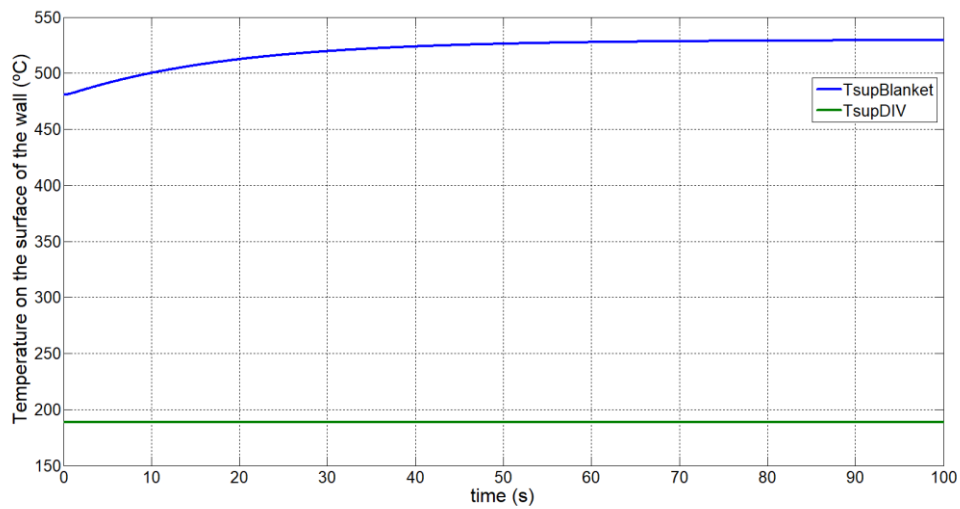


Figure 610: HCLL DEMO2 BB LOCA 60% in all the cooling loops (FW and internal channels). Temperature on the surface of the blanket and divertor wall graphic.

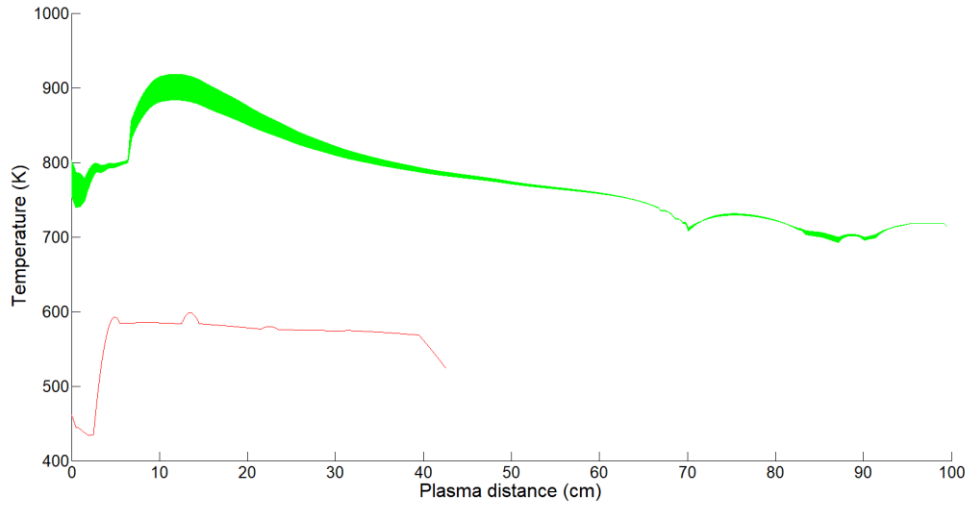


Figure 611: HCLL DEMO2 BB LOCA 60% in all the cooling loops (FW and internal channels). Evolution of the BB and divertor temperature graphic.

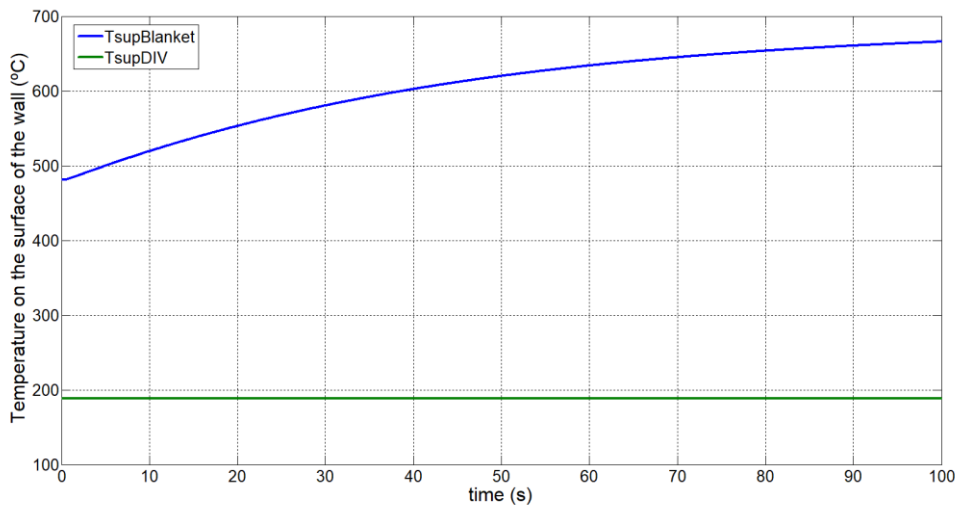


Figure 612: HCLL DEMO2 BB LOCA 90% in all the cooling loops (FW and internal channels). Temperature on the surface of the blanket and divertor wall graphic.

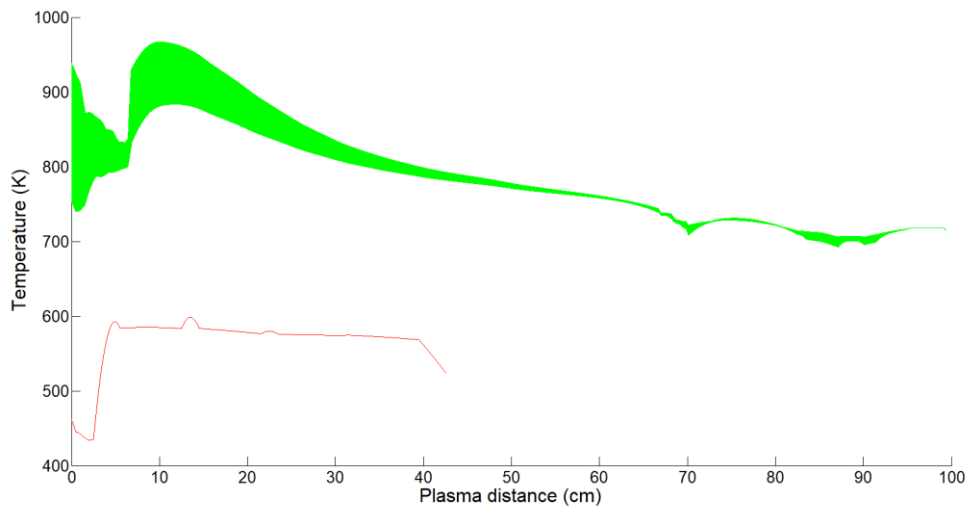


Figure 613: HCLL DEMO2 BB LOCA 90% in all the cooling loops (FW and internal channels). Evolution of the BB and divertor temperature graphic.

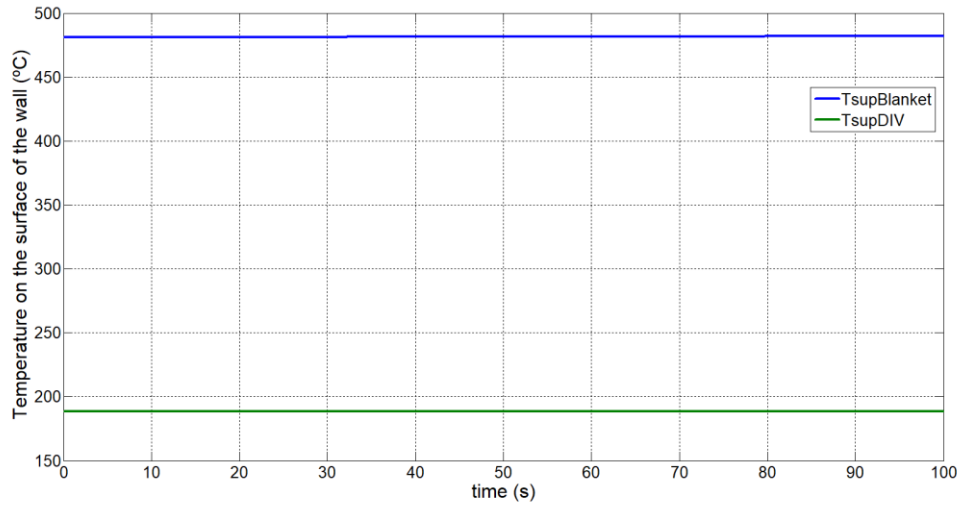


Figure 614: HCLL DEMO2 BB LOCA 90% in the internal channels. Temperature on the surface of the blanket and divertor wall graphic.

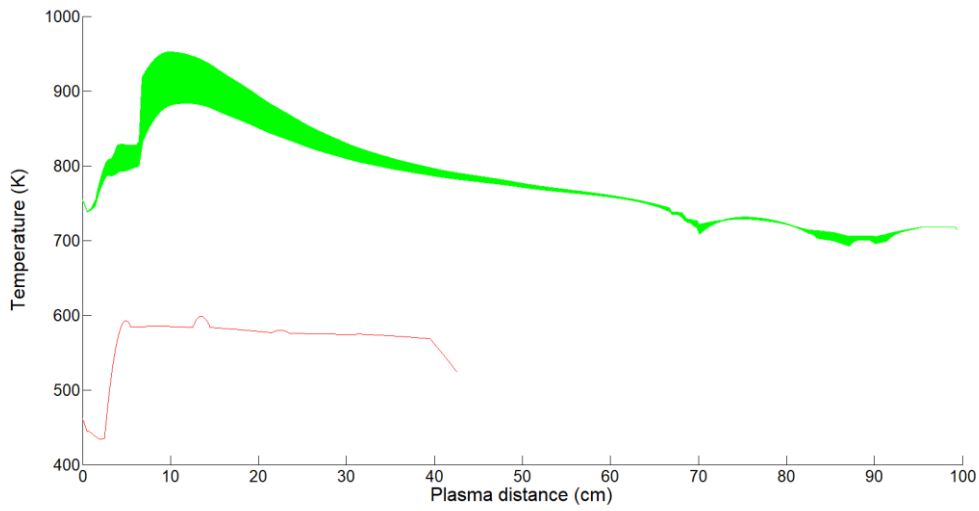


Figure 615: HCLL DEMO2 BB LOCA 90% in the internal channels. Evolution of the BB and divertor temperature graphic.

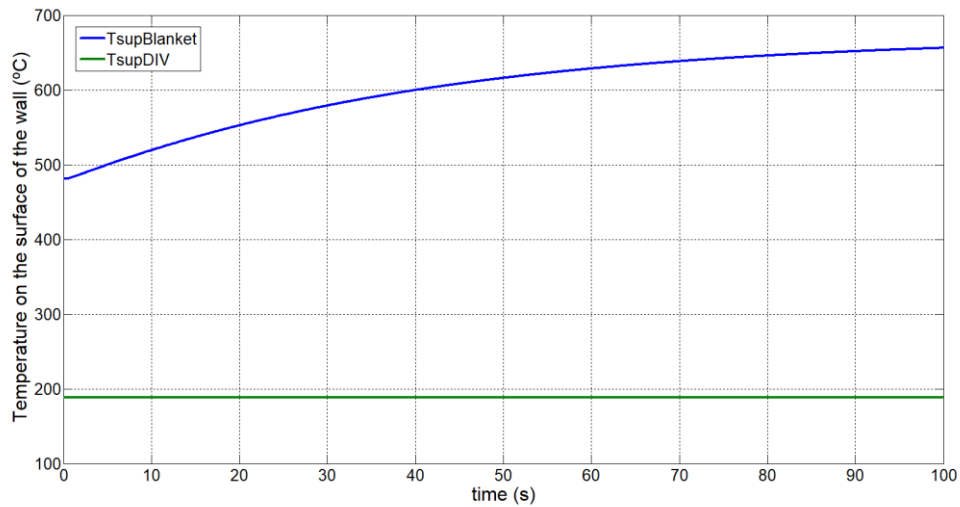


Figure 616: HCLL DEMO2 BB LOCA 90% in the FW cooling loop. Temperature on the surface of the blanket and divertor wall graphic.



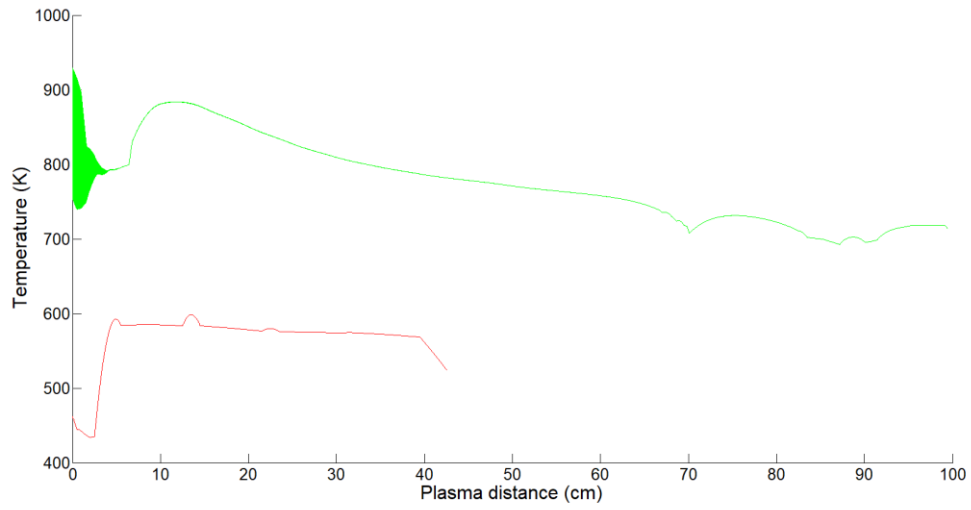


Figure 617: HCLL DEMO2 BB LOCA 90% in the FW cooling loop. Evolution of the BB and divertor temperature graphic.