

Effects of local ECCD driven by the optimized Equatorial and Upper EC Launchers on ITER

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The present ITER base-line design has the EC launchers providing only co-ECCD. A variant of the EC system was proposed to enlarge the physics programs covered by the Upper (UL) and Equatorial (EL) Launchers. This study aims to provide the potential range of the q profile control achievable by this optimization, including the possibility to drive cnt-ECCD and central ECH. Since the EL can only drive co-ECCD, if ECH power is needed to assist the L-H transition during ramp-up, it can have detrimental effects on the final profiles, such as removing the reverse shear. Cnt-ECCD offers greater control of the plasma current density and provides, when balanced with co-ECCD, pure ECH with no net driven current. The performance of the EL in tailoring the q profile by adding co-/cnt-ECCD is analyzed. Effects of current drive and deposition width on sawtooth control by UL are also discussed. The modeling is carried out with both equilibrium and transport codes.