

HYDROGEN MINORITY ION CYCLOTRON RESONANCE HEATING IN PRESENCE OF THE ITER-LIKE WALL IN JET

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Carbon is not compatible with the long term use required for plasma facing components in future fusion reactors of the tokamak type e.g. from the point of view of erosion and tritium retention. To test if the radiation due to material sputtered off metal vessel parts can remain modest enough to avoid a radiation collapse of the plasma, JET was equipped with beryllium (as opposed to C or C-coated) walls in the shutdown of 2010-2011. To sustain the very high heat loads inevitably falling on it and thus excluding the use of metals with a low melting point such as Be and in spite of the fact that its radiation is significant because of its large Z, a Tungsten (W) or W-coated divertor was simultaneously installed.

The most recent JET campaign has focused on characterizing operation with this "ITER-like" wall (ILW). One of the questions that needed to be answered is whether the auxiliary heating methods do not lead to unacceptable high levels of impurity influx preventing fusion-relevant operation. In view of its high single pass absorption, hydrogen minority fundamental cyclotron heating was chosen as the reference wave heating scheme in the ion cyclotron domain of frequencies. Wave induced impurity influx and associated radiation as well as heating performance will be discussed. In particular, the dependence of the results on the minority concentration will be addressed.

* See the Appendix of F. Romanelli et al., Proceedings of the 23rd IAEA Fusion Energy Conference 2010, Daejeon, Korea