

## **ICRH of JET and LHD Majority Ions at Their Fundamental Frequency**

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Results of the experimental studies of ICRH at the fundamental frequency of the majority deuterons in JET plasmas with near-tangential deuteron neutral beam injection (NBI) are presented. 1D, 2D and 3D modeling of JET plasmas ICRH with the application of TOMCAT, CYRANO and PSTELION codes, respectively, indicated that several ITER relevant mechanisms of heating may occur simultaneously in this heating scheme: fundamental ion cyclotron resonance heating of majority D ions, parasitic impurity ion heating and electron heating due to Landau damping and TTMP. All these mechanisms were studied in JET experiments with a ~90% D, 5% H plasma including traces of Be and Ar. Up to 2MW of ICRH power was applied at 25 MHz to NBI heated plasma. In most of the discharges the toroidal magnetic field strength was 3.3T, but in one it was equal to 3.6T. Effect of Doppler shift of beam deuterons away from the cold resonance at which  $E_{\perp}$  - the RF electric field component that governs ion heating - is small was used enhanced RF power absorption efficiency. Fundamental ICRH experiment was carried out in LHD hydrogen plasma with intensive high-energy hydrogen NBI. ICRH was performed at frequency 38MHz with injected power <1 MW. The effect of fundamental ICRH was demonstrated in these experiments: accelerating of fast beam ions, electron and ion heating.

\* See the Appendix of M.L.Watkins et al., Fusion Energy 2006 (Proc. 21st Int. Conf. Chengdu, 2006) IAEA, (2006)