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ICRH Physics and IGNITOR Experiments with Reduced Parameters* A. CARDINALI, ENEA, Italy, G. CENACCHI, A. AIROLDI, CNR I.F.P., Italy, B. COPPI, M.I.T. — In Ignitor, preparatory experiments with reduced machine parameters are planned before full performance operation. A transport analysis has been carried out to verify that the ideal ignition conditions in D-T plasmas are determined, a significant physics objective. The relevant Ion Cyclotron Heating applied for these regimes is studied in order to identify the power deposition profiles to be used in the transport analysis. The Ignitor ICRH system can operate with a large frequency band (80-120 MHz) in a sufficiently broad range (4-12 MW) of delivered power. This frequency band, is consistent with the use of magnetic fields in the range 9-13 T. In the considered reduced parameter scenarios the magnetic field is 9T with a plasma current of 7 MA in the extended limiter configuration and 6 MA in the double X-point configuration. A parametric study of the power deposition profiles is presented as function of the minority concentration, minority species, frequency band for both configurations, by using a full wave code in plane and toroidal geometry. An optimum frequency band is found in the range 85-95 Mhz with a delivered power of 8 MW (limiter configuration) and 5 MW (X-point). The power is essentially absorbed by the minority and redistributed collisionally to the ion species of the bulk plasma.

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