

Analysis of ICRF-accelerated ions in ASDEX Upgrade

M. J. Mantsinen,^{1,2} R. Bilato,¹ Vl. Bobkov,¹ L.-G. Eriksson,³ H.-U. Fahrbach,¹ M. García-Muñoz,¹ J.-M. Noterdaeme,^{1,4} W. Schneider¹ and the ASDEX Upgrade Team

¹*Max Planck Institute for Plasma Physics, EURATOM Association, Garching, Germany*

²*Helsinki University of Technology, Association Euratom-Tekes, Finland*

³*Association EURATOM-CEA, CEA/DSM/DRFC, CEA Cadarache, F-13108 St. Paul lez Durance, France*

⁴*Gent University, EESA Department, Gent, Belgium*

MHD-induced losses of fast ions with energy in the MeV range have been observed during high-power ICRF heating of hydrogen minority ions in the ASDEX Upgrade tokamak with the recently installed fast ion loss detector [1]. ICRF heating and ICRF-driven fast ions in representative discharges are analyzed. The main aim is to identify the lost ion species consistent with available fast-ion-relevant data and to calculate with RF modelling tools the ICRF-driven fast ion distributions. These could be used in MHD modelling codes to evaluate the fast ion losses and to compare with experimental loss ion data.

The effects of ICRF-driven radial transport of resonant ions due to absorption of the wave toroidal momentum with toroidally asymmetric waves on the fast ion distribution are quantified for typical ASDEX Upgrade plasma conditions. Both the present two-strap antennas and the planned new four-strap antennas are considered.

[1] M. García-Muñoz *et al.*, 32nd EPS Plasma Physics Conf. (Tarragona, Spain, 2005) P5.085.