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P4.1079 First applications of the ICRF modelling code PION in the ITER integrated modelling and analysis suit

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Ion Cyclotron Resonance Frequency (ICRF) heating is one of the three auxiliary heating methods foreseen for ITER. The ICRF scenarios in ITER have been recently reassessed with emphasis on the heating and current drive performance and H-mode access capabilities [1,2] based on simple one-dimensional wave damping calculations. Detailed studies using self-consistent transport simulations taking into account the various plasma heating sources due to ICRF waves in ITER are still lacking. For such studies, the ITER Integrated modelling and Analysis Suite (IMAS) [3] provides a natural platform. In this work, we report on the integration and the first applications of the ICRF modeling code PION [4] in IMAS. PION computes the ICRF power absorption and the distribution functions of the resonant ions in a self-consistent way. It has been extensively compared against experimental results for a large variety of ICRF schemes on JET, AUG, DIII-D and Tore Supra. It is based on simplified models, which makes it relatively fast and, thereby, suitable for use in an integrated modelling framework such as IMAS. In our first PION simulations in IMAS we have studied the ICRF schemes foreseen in the early non-active phase of ITER operation at magnetic fields of 1.8, 2.65 and 5.3T in H and 4He plasmas. References [1] M. Schneider et al. Proc. 44th EPS conf on Plasma Physics, ECA 41F, P5.153 (2017). [2] M. Schneider et al., EPJ Web. Conf. 157, 03046 (2017). [3] S. D. Pinches et al., Proc. 27th IAEA Fusion Energy Conf., TH/P6-7 (2018). [4] L.-G. Eriksson, T. Hellsten and U. Willén, Nucl. Fusion 33, 1037 (1993).

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