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Measurements and simulations of ICRF induced plasma convection in front of the 3-strap antennas in ASDEX Upgrade WEI ZHANG, Ghent University, THE ASDEX UPGRADE TEAM, THE EUROFUSION MST1 TEAM — Plasma heating with waves in the Ion Cyclotron Range of Frequency (ICRF) is one of the standard heating methods in tokamaks. The parallel (to the magnetic field) component of the electric field of the waves enhances the edge plasma potential nonlinearly through radio-frequency-sheath (rf-sheath) rectification. The gradient of this potential across magnetic field drives plasma convection in the Scrape-Off Layer. To reduce the rf-sheath driven close to ICRF antennas, the parallel electric near-field has to be decreased. This can be achieved by minimization of undesired parasitic currents induced in the antenna box by the antenna currents. New antennas with a novel approach to reduce those undesired currents through the proper phase and amplitude of the current in 3-straps have been installed and validated on ASDEX Upgrade. With reflectometers embedded in one 3-strap antenna at different poloidal locations, the density profiles in front of the antenna can be measured in when the antenna is either active or passive. The ICRF induced edge plasma convection in different antenna feeding configurations (different phasing, different power ratio between the central and the side straps) has thus been studied. Also we have carried out comprehensive simulations by running the EMC3EIRENE, RAPLICASOL and SSWICH codes in an iterative and quasi self-consistent way. The steadystate ICRF induced plasma density convection can clearly be reproduced in the models and compared with the ones measured in experiments.

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