

Density profile sensitivity study of ASDEX Upgrade ICRF Antennas with the TOPICA code

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During operation of AUG ICRF system, W-coated poloidal limiters and structures connected along magnetic field lines to the antenna are a source of W, which is attributed to sputtering by ions accelerated in RF sheaths. In order to analyze and optimize the ICRF antenna performance, accurate and efficient simulation tools are necessary. TOPICA code was developed for analysis of ICRF antenna systems with plasma loading conditions modeled with 1D FELICE code.

This paper presents a comparative analysis of two AUG ICRF antennas for a set of model density profiles (with varying density gradient and antenna cut-off distance) and for experimental ones. The antennas are presently installed in AUG and differ in that one was partially optimized using HFSS code to reduce E_{\parallel} near fields. Distributions of the electric field near the antenna and E_{\parallel} field in the region between the straps and the plasma are evaluated. Sheath driving RF potentials are computed.