

## **Simulations of different Faraday screen configurations for the ITER ICRH antenna.**

<sup>1</sup> F. Braun, <sup>1</sup> J.-M. Noterdaeme, <sup>2</sup> L. Colas,

<sup>1</sup> *MPI für Plasmaphysik, Garching, Germany*

<sup>2</sup> *CEA Cadarache, France*

The antenna system developed for ICRF (Ion Cyclotron Radio Frequency) heating of ITER consists of 6 poloidal \* 4 toroidal straps to deliver the power to the plasma. The 3-D High Frequency Structure Simulator (HFSS from ANSOFT) has been used to model and optimize different antenna and Faraday shield configurations. Although a real plasma cannot be modeled, a wide range of absorption types can be studied with this programme: radiation into free space, water absorption ( $\epsilon_r = 81.4 \text{ S/ m}$ ), isotropic media ( $\epsilon_r = 2500 + 2000i$ ) and anisotropic media ( $\epsilon_r = -20000, 1, 1$ ).

By simulating the different structural parts of the antenna with stainless steel (SS) and perfect conductors (PC), we can distinguish between radiation from and losses within the antenna. Different geometries of the Faraday screen (FS), from optically very open to optically closed have been compared.

For all of these configurations, the S-parameters, electric fields and currents have been calculated to address the losses in the antenna and the radiation into different absorbing media. These simulations have been done on 1/8 of the 24 strap array.

Finally, the complete 24 ITER antenna array, radiating into anisotropic media with different phasing, has been calculated, and the results will be presented.