

## **Simulations of ICRF antenna near-fields in dielectric media and cold plasmas with COMSOL\***

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Simulations of realistic RF antennas have been performed with the finite element analysis software package COMSOL [1] both with dielectric medium and cold plasma loading. Results will be presented from simulations with a finite (low) plasma density in the antenna box and ITER like density profile in front of the antenna, in view of the implementation of sheath effects in the models. First steps were made to introduce the presence of sheaths by means of a non-linear boundary condition [2].

Output characteristics such as S parameters and fields have been compared with results from CST Microwave Studio® [3] and the TOPICA code [4]. Good agreement has been found, which illustrates the potential of the present COMSOL-based modeling to benchmark antenna codes such as TOPICA.

[1] Comsol Multiphysics, [www.comsol.com](http://www.comsol.com)

[2] D.A. D'Ippolito, J.R. Myra, Phys. Plasmas **13** (2006), 102508

[3] CST GmbH, CST Microwave Studio® User Manual (2008)

[4] V. Lancelotti et al., Nucl. Fusion, **46** (2006) S476-S499

\*This work was supported by Research Foundation - Flanders