

## **Analysis and design of antennas facing cylindrical plasma columns with TOPCYL**

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On recent years TOPICA[1] has shown its capabilities as a designing tool for ICRF and LH antennas on tokamaks, handling both the realistic geometrical detail of the structure as well as a complete description of the plasma region behavior. Now, expanding these capabilities, the TORino Polytechnic CYLindrical code (TOPCYL) has been developed in order to give a full wave simulation of antennas facing cylindrical plasma columns. This feature allows the analysis and design of RF heating systems for specific applications as VASIMR-like plasma thrusters and plasma-surface-interaction (PSI) experiments[2]; nevertheless in general the only requirement is for the plasma to be a cylinder.

In the present work, the theoretical basis and implementation of TOPCYL is presented, as well as its validation against published measurements with plasma and laboratory measurements with dielectric.

Results obtained on simulating innovative antennas for the ICRF and 2,45 GHz regime in front of cylindrical plasma are also presented.

[1] Nucl. Fusion, **46** (2006) S476.

[2] M.F. Graswinckel, this conference.