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Advanced electric field computation for RF sheaths prediction with TOPICA DANIELE MILANESIO, RICCARDO MAGGIORA, Politecnico di Torino — The design of an Ion Cyclotron (IC) launcher is not only driven by its coupling properties, but also by its capability of maintaining low parallel electric fields in front of it, in order to provide good power transfer to plasma and to reduce the impurities production. However, due to the impossibility to verify the antenna performances before the starting of the operations, advanced numerical simulation tools are the only alternative to carry out a proper antenna design. With this in mind, it should be clear that the adoption of a code, such as TOPICA [1], able to precisely take into account a realistic antenna geometry and an accurate plasma description, is extremely important to achieve these goals. Because of the recently introduced features that allow to compute the electric field distribution everywhere inside the antenna enclosure and in the plasma column, the TOPICA code appears to be the only alternative to understand which elements may have a not negligible impact on the antenna design and then to suggest further optimizations in order to mitigate RF potentials. The present work documents the evaluation of the electric field map from actual antennas, like the Tore Supra Q5 and the JET A2 launchers, and the foreseen ITER IC antenna.

[1] D. Milanesio et al., Nucl. Fusion 49, 115019 (2009).

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