

BENCHMARK OF COUPLING CODES (ALOHA, TOPLHA AND GRILL3D) WITH ITER LOWER HYBRID ANTENNA

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In order to assist the design of the future ITER Lower Hybrid launcher, coupling codes ALOHA, from CEA Cadarache, TOPLHA, from Politecnico di Torino, and GRILL3D (Dr.Mikhail Irzak, A.F.Ioffe Physico-Technical Institute, St. Petersburg, Russia), from ENEA Frascati, have been compared with the initial (3 modules with 8 active waveguides per module) and updated (6 modules with 4 active waveguides per module) Passive-Active Multi-junction (PAM) Lower Hybrid antennas. Both ALOHA and GRILL3D formulate the problem in terms of rectangular waveguides modes, while TOPLHA is based on boundary-value problem with the adoption of a triangular cell-mesh to represent the relevant waveguides surfaces.

Several plasma profiles, with varying edge density and density increase, have been adopted to provide a complete description of the simulated launcher in terms of reflection coefficient, computed at the beginning of each LH module, and of power spectra. Good agreement can be observed among codes for all the simulated profiles.