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TOPLHA and ALOHA: comparison between Lower Hybrid wave coupling codes[1] ORSO MENEGHINI, MIT PSFC, J. HILLAIRET, M. GONICHE, CEA, R. BILATO, IPP/Garching, D. VOYER, ECL, R. PARKER, MIT PSFC, PFA AND PDT TEAM — TOPLHA and ALOHA are wave coupling simulation tools for LH antennas. Both codes are able to account for realistic 3D antenna geometries and use a 1D plasma model. In the framework of a collaboration between MIT and CEA laboratories, the two codes have been extensively compared. In TOPLHA the EM problem is self consistently formulated by means of a set of multiple coupled integral equations having as domain the triangles of the meshed antenna surface. TOPLHA currently uses the FELHS code for modeling the plasma response. ALOHA instead uses a mode matching approach and its own plasma model. Comparisons have been done for several plasma scenarios on different antenna designs: an array of independent waveguides, a multi-junction antenna and a passive/active multi-junction antenna. When simulating the same geometry and plasma conditions the two codes compare remarkably well both for the reflection coefficients and for the launched spectra. The different approach of the two codes to solve the same problem strengthens the confidence in the final results.

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