Abstract Submitted
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Substantial Fast-Wave Power Flux in the SOL of a Cylindrical Model; Comparison with Coaxial Modes R.J. PERKINS, N. BERTELLI, J.C. HOSEA, C.K. PHILLIPS, G. TAYLOR, J.R. WILSON, PPPL — The NSTX high-harmonic fast-wave (HHFW) heating system can lose a significant amount of power along magnetic fields lines in the SOL to the divertor regions under certain conditions [1]. A cylindrical cold-plasma model, with parameters resembling those of NSTX, shows the existence of modes with relatively large RF field amplitudes in the low-density annulus [2], similar to recent results found with the full-wave simulation AORSA [3]. Here, we compare and contrast these modes against "coaxial modes," modes that resemble TEM modes found in coaxial cables. We also compute the 3D Poynting flux as a function of length along the cylinder for comparison to NSTX. Such work is part of an effort to include the proper edge damping into full-wave codes so that they can reproduce the losses observed in NSTX and predict their importance for ITER. This work was supported by DOE Contract No. DE-AC02-09CH11466.

[1] J.C. Hosea et al., Phys. Plasmas 15 (2008) 056104.
[2] R.J. Perkins et al., 41st EPS Conf. Plasma Phys., Berlin June 23-17 2015, P2.059.
[3] N. Bertelli et al., Nucl. Fusion 54 (2012) 083004.

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