Abstract Submitted
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Sensitivity of wave propagation in the LHRF to initial poloidal position in finite-aspect-ratio toroidal plasmas[1] J.J. LARSON, U. Iowa, R.I. PINSKER, General Atomics, P.T. BONOLI, M. PORKOLAB, MIT — The important effect of varying the initial poloidal wave-launching location to the core accessibility of lower hybrid slow waves in a torus of finite aspect ratio has been understood for many years [1]. Since the qualitative properties of the wave propagation of the other branch in this regime, known as the 'whistler', 'helicon' or simply the 'fast wave', are similar in some ways to those of the slow wave [2], we expect a dependence on launch position for this wave also. We study this problem for both slow and fast waves, first with simplified analytic models and then using the ray-tracing code GENRAY for realistic plasma equilibria. We assess the prospects of inside, top, bottom or conventional outside launch of waves on each of the two branches. Although the slow wave has been the focus of research for LHRF heating and current drive in the past, the fast wave will play a major role in burning plasmas beyond ITER where $T_e(0)$ = 10-20 keV. The stronger electron Landau damping of the slow wave will restrict the power deposition to the outer third of the plasma, while the fast wave's weaker damping allows the wave to penetrate to the hot plasma core before depositing its power. [1] P.T. Bonoli and E. Ott, Phys. Fluids **25**, 359 (1982) [2] R.I. Pinsker, Phys. Plasmas **22**,090901 (2015)

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