Abstract Submitted
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Penetration and Scattering of Lower Hybrid Waves by Density Fluctuations[1] WENDELL HORTON, Institute for Fusion Studies, Univ. Texas at Austin, M. GONICHE, Y. PEYSSON, J. DECKER, A. EKEDAHL, X. LITAUDON, CEA, IRFM, F-13108 St-Paul-Lez-Durance, France — Lower Hybrid [LH] ray propagation in toroidal plasma is controlled by a combination of the azimuthal spectrum launched from the antenna, the poloidal variation of the magnetic field, and the scattering of the waves by the density fluctuations. The width of the poloidal and radial RF wave spectrum increases rapidly as the rays penetrate into higher density and scatter from the turbulence. The electron temperature gradient [ETG] spectrum is particularly effective in scattering the LH waves due to its comparable wavelengths and parallel phase velocities. ETG turbulence is also driven by the radial gradient of the electron current density giving rise to an anomalous viscosity spreading the LH-driven plasma currents. The scattered LH spectrum is derived from a Fokker-Planck equation for the distribution of the ray trajectories with diffusivity proportional to the fluctuations. The LH ray diffusivity is large giving transport in the poloidal and radial wavenumber spectrum in one - or a few - passes of the rays through the core plasma.

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