

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

High frequency RF waves¹ WILLIAM HORTON, M. BROOKMAN, University of Texas at Austin, M. GONICHE, Y. PEYSSON, A. EKEDAHL, CEA, IRFM — ECH and LHCD- are scattered by the density and magnetic field turbulence from drift waves as measured in and Tore Supra-WEST, EAST and DIII-D. Ray equations give the spreading from plasma refraction from the antenna through the core plasma until and change the parallel phase velocity evolves to where RF waves are absorbed by the electrons. Extensive LH ray tracing and absorption has been reported using the coupled CP3O ray tracing and LUKE electron phase space density code with collisionless electron-wave resonant absorption. In theory and simulations are shown for the ray propagation with the resulting electron distributions along with the predicted X ray distribution that compared to the measured X-ray spectrum. Lower-hybrid is essential for steady-state operation in tokamaks with control of the high-energy electrons intrinsic to tokamaks confinement and heating. The record steady tokamak plasma is Tore Supra a steady 6 minute steady state plasma with 1 Gigajoule energy passing through the plasma. WEST is repeating the experiments with ITER shaped separatrix and divertor chamber and EAST achieved comparable long-pulse plasmas. Results are presented from an IFS-3D spectral code with a pair of inside-outside LHCD antennas and a figure-8 magnetic separatrix are presented. Scattering of the slow wave into the fast wave wave is explored showing the RF scattering from drift wave dn_e and dB increases the core penetration may account the measured broad X-ray spectrum.

¹Work supported by the DoE through grants to the Institute for Fusion Studies [DE-FG02-04ER54742], ARLUT and General Atomics, San Diego, California, USA and the IRFM at Cadarache by the Commissariat Energie Atomique, France.

William Horton
University of Texas at Austin

Date submitted: 17 Jul 2017

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