

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Waveguide to Core: A New Approach to RF Modelling¹ JOHN WRIGHT, SYUNICHI SHIRAIWA, MIT-PSFC, RF-SCIDAC TEAM² — A new technique for the calculation of RF waves in toroidal geometry enables the simultaneous incorporation of antenna geometry, plasma facing components (PFCs), the scrape off-layer (SOL) and core propagation [Shiraiwa, NF 2017]. Calculations with this technique naturally capture wave propagation in the SOL and its interactions with non-conforming PFCs permitting self-consistent calculation of core absorption and edge power loss. The main motivating insight is that the core plasma region having closed flux surfaces requires a hot plasma dielectric while the open field line region in the scrape-off layer needs only a cold plasma dielectric. Spectral approaches work well for the former and finite elements work well for the latter. The validity of this process follows directly from the superposition principle of Maxwell's equations making this technique exact. The method is independent of the codes or representations used and works for any frequency regime. Applications to minority heating in Alcator C-Mod and ITER and high harmonic heating in NSTX-U will be presented in single pass and multi-pass regimes.

¹Support from DoE grant number DE-FG02-91-ER54109 (theory and computer resources) and DE-FC02-01ER54648 (RF SciDAC)

²please place together with other RF-SciDAC team posters

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Date submitted: 14 Jul 2017

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