

Abstract Submitted  
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**A matched asymptotic treatment of the reflection of LH waves from a cutoff** A.S. RICHARDSON, P. BONOLI, J. WRIGHT, MIT Plasma Science and Fusion Center — Ray tracing techniques can be used to estimate the propagation of RF fields in plasmas. However, for lower-hybrid waves there are discrepancies between the power density profiles calculated using full-wave codes and those calculated using ray tracing simulations [1]. Previous work suggests that this discrepancy could be caused by the reflections of the LH waves from the cutoff [2,3]. In this poster, we calculate the effect of reflections from the cutoff, in the context of ray tracing and the WKB approximation. Using a linearized dispersion matrix to model the plasma at the cutoff, we obtain a local solution for the LH field at the cutoff. This local solution differs from the standard Airy-like form because of the intrinsic vector nature of the fields. Our local solution is then matched asymptotically to incoming and outgoing LH waves. The matching coefficients can then be used to interpret the reflection at the cutoff as a scattering process, where incoming rays are related to outgoing rays by a scattering matrix. [1] P. Bonoli, et al., Phys. Plasmas 15, 056117 (2008) [2] J. Wright, APS-DPP 2008, VI2.00003 [3] A. Schmidt, APS-DPP 2008, JO3.00003 Supported by the DOE OFES.

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