Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Ray Splitting Model of O-X Mode Conversion JOSHUA ACHIAM, UF-Gainesville, ANDREW RICHARDSON, LANL, FRANCESCO VOLPE, UW-Madison — Mode conversions (MCs) allow waves to be transmitted through evanescent layers and power to be deposited in (and diagnostic information to be extracted from) otherwise inaccessible regions in magnetized fusion plasmas. MCs can only be modeled by conventional ray tracing techniques if the incident ray is fully converted into an outgoing, transmitted ray and if the WKB approximation is fulfilled everywhere. However, in most experiments the conversion is partial; only some of the incident power is mode-converted. The WKB approximation also fails in the cases of resonances and cutoffs. An algorithm was recently developed which models the MC as the splitting of a single ray into a transmitted and reflected part. Continued testing of this algorithm was carried out by developing a module for the ART ray tracing code and simulating the O-X mode conversion, where an incoming ordinary mode ray splits into a reflected ordinary mode ray and a transmitted extraordinary mode ray. Computed conversion efficiencies were compared with analytical predictions.

Joshua Achiam
University of Florida

Date submitted: 25 Jul 2011 Electronic form version 1.4