Abstract Submitted
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Quadratic Effects in Conversion[1] ANDREW RICHARDSON, EUGENE TRACY, William and Mary, ALLAN KAUFMAN, UC Berkeley and LBNL — Phase space ray-tracing techniques can be used to solve wave problems exhibiting mode conversion [1,2]. The (x,k)-dependence of the dispersion matrix, **D**, is linearized near the conversion, and the matrix is then converted back to an operator. The resulting coupled equations can be solved for the local fields. Matching these local solutions onto uncoupled WKB far-field solutions gives scattering coefficients which can be used to treat the mode conversion as a ray-splitting process. In this work, we study the effects of quadratic terms in **D** near a mode conversion. We show that for one spatial dimension, **D** can be put into normal form, where the diagonals contain quadratic corrections, and the off-diagonals are the constant coupling. The quadratic terms introduce phase corrections to the far-field coupled WKB solutions, while the local solutions have both amplitude and phase corrections. These corrections allow for better matching at the conversion, which we illustrate by comparing the asymptotic solution with a numerical solution for the 1-D conversion. 1] A. Jaun, E. Tracy and A. Kaufman, Plasma Phys. Control. Fusion 49, 43-67 (2007). 2] E. Tracy, A. Kaufman and A. Jaun, to appear, Phys. Plasmas (2007).

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