Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

A new normal form for multidimensional mode conversion[1] E. TRACY, A. RICHARDSON, N. ZOBIN, William and Mary, A. KAUFMAN, UC Berkeley and LBNL — Linear conversion occurs when two wave types are locally resonant in a nonuniform plasma [1]. In recent work, we have shown how to incorporate a ray-based approach to mode conversion in numerical algorithms [2,3] for the most common type of conversion. Here, we present a new formulation that can deal with more general cases [4]. We exploit a new normal form for the 2X2 dispersion matrix defined such that the diagonals Poisson- commute with the off-diagonals (at leading order). Therefore, if we use the diagonals as ray Hamiltonians, the off- diagonals will be constant. Thus, the 2X2 dispersion matrix in normal form has a very natural physical interpretation: the diagonals are the uncoupled ray Hamiltonians and the off-diagonals are the coupling. We further discuss how to incorporate the normal form into ray tracing algorithms. 1] E. Tracy, A. Kaufman and A. Brizard, Phys. Plasmas **10** (2003) 2147. 2] A. Jaun, E. Tracy and A. Kaufman, Plasma Phys. Control. Fusion **49** (2006) 43. 3] E. Tracy, A. Kaufman and A. Jaun, to appear in Phys. Plasmas. 4] A. Kaufman, E. Tracy and A. Brizard, Phys. Plasmas **12** (2005) 022101. 5] E. Tracy and A. Kaufman, PRL **91** (2003) 130402.

[1]Supported by the NSF-DOE Program in Basic Plasma Physics and the DOE OFES.

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Date submitted: 19 Jul 2007 Electronic form version 1.4