Abstract Submitted
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Phase-space Path Integrals for Vector Wave Equations and Linear Mode Conversion A.S. RICHARDSON, E.R. TRACY, Physics Dept, William & Mary, N. ZOBIN, Mathematics Dept, William & Mary, A.N. KAUFMAN, Physics Dept, UC Berkeley & LBNL — The use of path integrals in quantum mechanics was pioneered by Feynman, though key ideas were anticipated by Wentzel [1] and Wiener [2]. The treatment of classical wave equations, such as those in plasma physics, by path integral methods is mathematically identical to the quantum case, with the classical limit corresponding to the ray or WKB limit. Berezin [3] has developed a general method for recasting wave equations as path integrals. We consider regions where WKB assumptions are invalid and mode conversion occurs, a situation not previously considered. This leads to a new normal form for the local 2x2 wave dispersion matrix in the conversion region. Here the diagonals are interpreted as uncoupled dispersion functions, there are no avoided crossings, and the location of conversion along a ray is unambiguous.

1] S. Antoci and D.-E. Liebscher, Intl J Theo Phys 37 (1998) 531
2] N.Wiener, Acta Math 55 (1930) 117
3] F. A. Berezin and M. A. Shubin, The Schrödinger Equation (Kluwer, 1991)

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