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White light parametric instabilities JORGE SANTOS, LUIS SILVA, GoLP/CFP, Instituto Superior Tecnico, Lisbon, Portugal, ROBERT BINGHAM[1], Rutherford Appleton Laboratory, Chilton, Didcot, United Kingdom — The Wigner formalism of quantum mechanics provides an alternative formulation to describe waves propagating in a dispersive medium. However the wave equation describes a two mode problem, and all previous theoretical models, based on the Wigner-Moyal equation, only deal with the single mode problem, where propagation is assumed to obey a Schrödinger-like equation. We first present a formulation to describe the laser propagation in a cold plasma based on the Wigner formalism generalized to Klein-Gordon like-fields. We constructed a 2x2 Wigner matrix on the basis of the Hamiltonian form of the Klein-Gordon equation of a charged scalar particle field. The system of coupled transport equations governing the evolution of the photon densities in phase-space is then derived; this system is formally equivalent to the full wave equation. The system of transport equations for the photons is coupled with the relativistic fluid equations for the plasma. A general dispersion relation is obtained and, from first principles, the effect of a broadband radiation spectrum on stimulated Raman scattering is studied.

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