

Abstract Submitted
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A Hamiltonian electromagnetic gyrofluid model¹ F.L. WAELBROECK, Inst. Fusion Studies, Univ. Texas Austin, R.D. HAZELTINE, P.J. MORRISON, Inst. Fusion Studies, U. Texas at Austin — An isothermal truncation of the electromagnetic gyrofluid model of Snyder and Hammett [Phys. Plasmas 8, 3199 (2001)] is shown to be Hamiltonian. The corresponding noncanonical Lie-Poisson bracket and its Casimir invariants are presented. The model describes the evolution of the density, the electrostatic potential, and the component of the vector potential along a strong background field. This makes it suitable for describing such phenomena as the propagation of kinetic-Alfvén modons, the nonlinear saturation of drift-tearing modes, and the diamagnetic stabilization of the internal kink. The invariants are used to obtain a set of coupled Grad-Shafranov equations describing equilibria and propagating coherent structures. They also lead to a Lagrangian formulation of the equations of motion that is well suited to solution with the PIC method.

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