Abstract Submitted
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Hamiltonian Structure of a Collisionless Reconnection Model for High and Low β Plasmas[1] P.J. MORRISON, The University of Texas at Austin, Austin, TX, E. TASSI, D. GRASSO, Politecnico di Torino, Torino, Italy, F. WAELBROECK, The University of Texas at Austin, Austin, TX — The noncanonical Hamiltonian formulation of a recently derived four-field model describing collisionless reconnection is presented. The corresponding Lie-Poisson bracket is shown to be a sum of a direct and semi-direct product forms and to possess four infinite independent families of Casimir invariants. Three out of four of these families are directly associated with the existence of Lagrangian invariants of the model. Two of the invariants generalize previously discovered invariants of a two-field model for reconnection in low-β plasmas. The variational principle is given for deriving general equilibrium equations and examples of equilibrium solutions are described explicitly. The normal modes of the system are identified, shown to be second variation (energy) stable, and normal canonical (action angle) coordinates are obtained.

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