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On the road to the Hamiltonian formulation of gyrokinetic theory A.J. BRIZARD, Saint Michael College, P.J. MORRISON, IFS & UT Austin, C. CHANDRE, E. TASSI, CPT Luminy — The Hamiltonian formulation of a general set of field equations is expressed in terms of a Hamiltonian functional and a Poisson-bracket structure involving functional derivatives with respect to dynamical fields. The Hamiltonian functional is normally constructed as the energy functional following a procedure outlined by Pfirsch and Morrison [1], which explicitly introduces polarization effects. The Poisson bracket must satisfy the standard antisymmetry and Leibniz properties as well as the Jacobi identity. We present work in progress on the Hamiltonian formulation for the guiding-center Vlasov-Maxwell equations (without redundant variables), as a prelude to the formulation for the gyrokinetic Vlasov-Maxwell equations [2].

[1] D. Pfirsch and P.J. Morrison, Phys. Rev. A **32**, 1714 (1985).

[2] A.J. Brizard and T.S. Hahm, Rev. Mod. Phys. **79**, 421 (2007).

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