Exact momentum conservation laws for gyrofluid and gyrokinetic models[1] ALAIN BRIZARD, Saint Michael College — Exact momentum conservation laws for gyrofluid and gyrokinetic models are derived by Noether method applied to the gyrofluid [1] and gyrokinetic [2,3] action functionals, respectively. As a result of the separation of a nonuniform (and time-independent) background magnetic field from the time-dependent dynamical fields, the gyrofluid and gyrokinetic momentum-stress tensors are asymmetric, which implies transport of angular momentum. The nature of the momentum-stress asymmetry for the gyrofluid model [1] is discussed in terms of reduced polarization and magnetization effects. The conservation of momentum for the gyrokinetic model [4], on the other hand, involves the Hamiltonian dynamics of the gyrocenter canonical momentum.

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Date submitted: 14 Jul 2010   Electronic form version 1.4