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The bi hamiltonian formulation of the landau Lifshitz equation

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ABSTRACT

The Landau Lifshitz (LL) equation is a universal model for integrable magnetic systems. It contains the sine Gordon (SG), nonlinear Schrodinger (NLS), and the Heisenberg model (HM) equations as particular or limiting cases. It is well known that NLS, SG, and HM equations possess recursion operators. A recursion operator of an equation in Hamiltonian form generates (a) a hierarchy of integrable equations, and (b) a second Hamiltonian operator and more generally a hierarchy of Poisson structures. Here the recursion operator of the LL equation is obtained algorithmically, and hence its bi Hamiltonian formulation is established.