

Supersymmetric Reciprocal Transformation and Its Applications

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Abstract:

The supersymmetric analog of the reciprocal transformation is introduced. This is used to establish a transformation between one of the supersymmetric Harry Dym equations and the supersymmetric modified Korteweg-de Vries equation. The reciprocal transformation, as a Bäcklund-type transformation between these two equations, is adopted to construct a recursion operator of the supersymmetric Harry Dym equation. By proper factorization of the recursion operator, a bi-Hamiltonian structure is found for the supersymmetric Harry Dym equation. Furthermore, a supersymmetric Kawamoto equation is proposed and is associated to the supersymmetric Sawada-Kotera equation. The recursion operator and odd bi-Hamiltonian structure of the supersymmetric Kawamoto equation are also constructed.