Nonlinear Sciences > Exactly Solvable and Integrable Systems

Darboux transformations for two dimensional elliptic affine Toda equations

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The Darboux transformations for the two dimensional elliptic affine Toda equations corresponding to all seven infinite series of affine Kac-Moody algebras, including $A_l^{(1)}$, $A_{2l}^{(2)}$, $A_{2l-1}^{(2)}$, $B_l^{(1)}$, $C_l^{(1)}$, $D_l^{(1)}$ and $D_{l+1}^{(2)}$, are presented. The Darboux transformation is constructed uniformly for the latter six series of equations with suitable choice of spectral parameters and the solutions of the Lax pairs so that all the reality symmetry, cyclic symmetry and complex orthogonal symmetry of the corresponding Lax pairs are kept invariant. The exact solutions of all these two dimensional elliptic affine Toda equations are obtained by using Darboux transformations.

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