Similarity reduction of q-difference equations of KdV type and Chazy-type second-degree q-difference equations

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Abstract

We present a scheme to obtain compatible similarity constraints for a class of integrable partial q-difference equations of KdV-type, the reduction of which leads to a hierarchy of second-degree ordinary q-difference equations. The lowest member of this hierarchy is a second-order second-degree equation which can be considered as a discrete analogue of equations in the class studied by Chazy. We present corresponding isomonodromic deformation problems and discuss the relation between this class of difference equations and other equations of Painlevé type.