

On integrable extensions

BURCU SILINDIR YANTIR

*Department of Mathematics, Faculty of Science
Dokuz Eylul University, Izmir, Turkey*

burcu.silindir@deu.edu.tr

We present the integrability of q -difference equations in the light of existence of multi-soliton solutions. Moreover, we constitute a unifying framework for q -discrete equations and their multi-soliton solutions that comprises various q -difference type of soliton equations such as sine-Gordon, KdV and Toda equations. For this purpose, we present a generic equation and develop three- q -soliton solutions, which are expressed in the form of polynomials in power functions. We conjecture the nonexistence of other unifying approaches to study integrable equations on quantum numbers or on any time scales via Hirota perturbation.