

The factorization of the q -difference operators
Alina Dobrogowska

Institute of Mathematics, University of Bialystok
Ciokowskiego 1M
15-245 Bialystok
Poland
alaryzko@alpha.uwb.edu.pl

We present certain classes of second order q -difference operators, which admit factorization into first order operators acting in a Hilbert space. Solutions of the q -deformed Schrödinger equation are presented for the following potentials: shifted oscillator, isotropic oscillator, Morse potentials. We also discuss classical limit case by letting $q \rightarrow 1$.

[1] A. Dobrogowska, G. Jakimowicz, Factorization method applied to the second order q -difference operators, *Appl. Math. Comput.* 228 (2014), 147-152.

[2] A. Dobrogowska, The q -deformation of the Morse potential, *Appl. Math. Lett.* 7 (2013), 769-773.

[3] A. Dobrogowska, The q -deformation of hyperbolic and trigonometric potentials, *Int. J. Difference Equ.* 9 (2014), no. 1, 45-51.

[4] A. Dobrogowska, A. Odziejewicz, Second order q -difference equations solvable by factorization method, *J. Comp. Appl. Math.* 193 (2006), 319-346.

[5] A. Dobrogowska, A. Odziejewicz, Solutions of the q -deformed Schrödinger equation for special potentials, *J. Phys. A: Math. Theor.* 40 (2007), 2023-2036.