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Mathematical Physics

Higher-order SUSY, exactly solvable potentials, and exceptional orthogonal polynomials

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(Submitted on 10 Jun 2011 ([v1]), last revised 31 Aug 2011 (this version, v3))

Exactly solvable rationally-extended radial oscillator potentials, whose wavefunctions can be expressed in terms of Laguerre-type exceptional orthogonal polynomials, are constructed in the framework of kth-order supersymmetric quantum mechanics, with special emphasis on $k=2$. It is shown that for $\mu=1$, 2, and 3, there exist exactly μ distinct potentials of μth type and associated families of exceptional orthogonal polynomials, where μ denotes the degree of the polynomial g_{μ} arising in the denominator of the potentials.

Submission history

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