

A limit $q \rightarrow -1$ for the big q -Jacobi polynomials

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We study a new family of "classical" orthogonal polynomials, here called big -1 Jacobi polynomials, which satisfy (apart from a 3-term recurrence relation) an eigenvalue problem with differential operators of Dunkl-type. These polynomials can be obtained from the big q -Jacobi polynomials in the limit $q \rightarrow -1$. An explicit expression of these polynomials in terms of Gauss' hypergeometric functions is found. The big -1 Jacobi polynomials are orthogonal on the union of two symmetric intervals of the real axis. We show that the big -1 Jacobi polynomials can be obtained from the Bannai-Ito polynomials when the orthogonality support is extended to an infinite number of points. We further indicate that these polynomials provide a nontrivial realization of the Askey-Wilson algebra for $q \rightarrow -1$.

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