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New Orthogonal Polynomials of Askey–Wilson Type

We study two families of orthogonal polynomials. The first is a finite family related to the Askey–Wilson polynomials but the orthogonality is on the real line. A limiting case of this family is an infinite system of orthogonal polynomials whose moment problem is indeterminate. We provide several orthogonality measures for the infinite family and derive their Plancherel-Rotach asymptotics. The polynomials also satisfy second order divided difference equations.