Asymptotics for Gegenbauer-Sobolev and Hermite-Sobolev orthogonal polynomials associated with non-coherent pairs of measures[*]

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Abstract

Inner products of the type $\langle f, g \rangle = \langle f, g \rangle_{\psi_0} + \langle f', g' \rangle_{\psi_1}$, where one of the measures ψ_0 or ψ_1 is the measure associated with the Gegenbauer (Hermite) polynomials, are usually referred to as Gegenbauer-Sobolev (Hermite-Sobolev) inner products. This presentation deals with some asymptotic relations associated with the orthogonal polynomials with respect to a class of Gegenbauer-Sobolev (Hermite-Sobolev) inner products. The inner products are such that the associated pairs of symmetric measures (ψ_0, ψ_1) are not within the concept of "symmetrically coherent pairs of measures", introduced by Iserles et al in1991.