MR1193813 (94c:33011) 33C45 (42C10)

Lewanowicz, Stanisław (PL-WROC-C)

Quick construction of recurrence relations for the Jacobi coefficients. (English summary)

J. Comput. Appl. Math. **43** (1992), *no. 3,* 355–372.

The author considers expansion of a function f in Jacobi polynomials $P_k^{(\alpha,\beta)}$ and is interested in deriving linear recurrence relations for the expansion coefficients, assuming that f satisfies a linear differential equation of order n with polynomial coefficients. Applying a general method derived earlier [S. Lewanowicz, Zastos. Mat. **21** (1991), no. 2, 303–326; MR1145485 (93d:33006)] to the cases $n = 1, 2, 3$, he obtains explicit (but rather complicated) forms for desired recurrence relations that require many case distinctions (10 when $n = 3$). Specific examples are worked out in the case where f is an associated Jacobi polynomial and one starts either from a second-order inhomogeneous, or from a fourth-order homogeneous, differential equation.

Reviewed by *Walter Gautschi*