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Section:

15. Numerical Analysis and Scientific Computing

1991 MS Classification: 33, 41, 65
Rappoport, Juri Moiseevich, Russian Academy of Sciences, Russia; Lozier, Daniel William, National Inst. Standards and Technology, USA
Numerical evaluation of modified Bessel functions
Approaches for the numerical evaluation of modified Bessel functions of the second order with complex parameter which are based on differential equation, power series, asymptotic expansions, quadrature formulas of trapezoidal kind with optimal step's choice, Lanczos's tau-method and Dziadyck's approximation method are developed. They can be useful for Kontorovich-Lebedev integral transform's applications and numerical solution of mixed boundary value problems of mathematical physics in wedge domains. The work is continued under support of the CRDF grant RM1–361.
References: D. W. Lozier, F. W. J. Olver, Airy and Bessel functions by parallel integration of ODEs, *Proceedings 6-th SIAM Conf. Scientific Computing*, v.2, 1993, 531–538. 2. J. M. Rappoport, Programms and some methods of the computation of Macdonald function, *OVM*, 1991.