Approximation Seminar: Optimal Approximation and Integration of Modified Bessel Functions

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The realization of the Lanczos Tau Method and Dzyadyck approximation method with optimal minimal residue is proposed for the numerical solution of the second order differential equations with polynomial coefficients including modified Bessel functions of imaginary order. The scheme of Tau method and Dzyadyck approximating method is optimized for the system of hypergeometric type differential equations including modified Bessel functions of complex order. The numerical quadratures of trapezoidal kind with optimal choice of the step are elaborated for modified Bessel functions computation.