

Non-traditional Jacobi Spectral-Collocation Method for Weakly Singular Integral Equations of the Second Kind

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Weakly singular integral equations of the second kind typically have non smooth solutions, which seriously affects the accuracy of spectral methods. We propose two numerical methods, implicitly linear and nonpolynomial Jacobi spectral-collocation methods to overcome the reduction in the numerical accuracy of the spectral methods caused by the singularities of the solutions. Convergence analysis in the L^∞ -norm is carried out and the exponential convergence rate is obtained. We demonstrate the efficiency of the proposed methods by numerical examples.

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