

## **Approximate solution of two-dimensional singular integral equation**

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**Abstract:** In this study, approximate quadrature formulas for numerical calculation of two-dimensional Vekua potential and singular integrals are obtained. The mechanical quadrature method for two-dimensional quasilinear singular integral equation with Vekua operators is described. The numerical results are compared with the exact solution of the integral equation.

**Keywords:** two-dimensional singular integral, singular integral equation, mechanical quadrature method.

### **References:**

- [1] V.N. Monakhov, Boundary-Value Problems with Free Boundaries for Elliptic Systems of Equations (Translations of Mathematical Monographs) (AMS, 1983).
- [2] I.N. Vekua, Generalized Analytic Functions (Pergamon Press, 1962).
- [3] C. Ashyralyev, Numerical algorithms of the solution for singular integral equations and their applications in hydrodynamic (Ylym, Ashgabat, 1994).
- [4] S.V. Rogosin, On nonlinear Vekua type equations, Nonlinear Analysis: Modeling and Control 11, no 2, 187-200, 2006.
- [5] V.D. Didenko, B. Silbermann, On the approximate solution of some two-dimensional singular integral equations, Math. Meth. Appl. Sci., 24, doi: 10.1002/mma.265, 1125-1138, 2001.