Half-bounded numerical solution of singular integral equations with Cauchy kernel.

ABSTRACT

In this study, a numerical solution for singular integral equations of the first kind with Cauchy kernel over the finite segment [-1,1] is presented. The numerical solution is bounded at x =1 and unbounded at x = -1. The numerical solution is derived by approximating the unknown density function using the weighted Chebyshev polynomials of the fourth kind. The force function is approximated by using the Chebyshev polynomials of the third kind. The exactness of the numerical solution is shown for characteristic equation when the force function is a cubic.

Keyword: Singular integral equations; Cauchy kernel; Chebyshev orthogonal polynomials.