

## **The expansion approach for solving cauchy integral equation of the first kind**

### **Abstract**

In this paper we expand the kernel of Cauchy integral equation of first kind as a series of Chebyshev polynomials of the second kind times some unknown functions. These unknown functions are determined by applying the orthogonality of the Chebyshev polynomial. Whereas the unknown function in the integral is expanded using Chebyshev polynomials of the first kind with some unknown coefficients. These two expansions in the integral can be simplified by the used of the property of orthogonality. The advantage of this approach is that the unknown coefficients are stability computed.

**Keyword:** Cauchy integral equation; Chebyshev polynomials; Galerkin method; Kernel expansion; Function expansion