Quadrature formula for evaluating left bounded Hadamard type hypersingular integrals

ABSTRACT

Left semi-bounded Hadamard type Hypersingular integral (HSI) of the form H(h,x)=1/´ 1+x/1-x ɔ-1∗∗1 1-t/1+t h(t)(t-x)2dt,x∈(-1.1), Where h(t) is a smooth function is considered. The automatic quadrature scheme (AQS) is constructed by approximating the density function h(t) by the truncated Chebyshev polynomials of the fourth kind. Numerical results revealed that the proposed AQS is highly accurate when h(t) is choosing to be the polynomial and rational functions. The results are in line with the theoretical findings.

Keyword: AQS; Chebyshev polynomials; Hypersingular integral; Left semi-bounded