A NUMERICAL METHOD TO SOLVE INTEGRAL EQUATIONS BY GAUSS AND ANTI-GAUSS QUADRATURE FORMULAE

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The aim of this talk is to present a global approximation method based on the Gauss and anti-Gauss quadrature rules [1, 2, 3] for the following integral equation

$$f(y) - \int_{-1}^{1} k(x,y) f(x) w(x) dx = g(y), \quad y \in [-1, 1],$$

where f is the unknown function, k and g are two given functions and $w(x) = (1-x)^{\alpha}(1+x)^{\beta}$ is a Jacobi weight with parameters $\alpha, \beta > -1$.

The convergence and the stability of the proposed method will be discussed in suitable weighted spaces and numerical tests will show the accuracy of the approach.

References

[1] D.P. Laurie, *Anti-Gaussian quadrature formulas*, Mathematics of Computation, 65 (1996), pp. 739–747.

[2] S.E. Notaris, *Anti-Gaussian quadrature formulae based on the zeros of Stieltjes polynomials*, BIT Numerical Mathematics, 58 (2018), pp. 179–198.

[3] M.S. Pranić and L. Reichel, *Generalized anti-Gauss quadrature rules*, Journal of Computational and Applied Mathematics, 284 (2015), pp. 235–243.