REVIEW OF THE TAU METHOD

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Abstract

The Tau method, introduced for the first time by C. Lanczos [1] in 1938, in order to find approximate solution for some physical problems. In 1956, C. Lanczos and E. L. Ortiz introduced in [2, 3] the recursive approach of the Tau method based on Canonical polynomials for numerical study of ordinary differential equation in the form

$$\sum_{i=0}^{\nu} p_i(x)y^{(i)}(x) = f(x), \quad g_j(y) = d_j, \qquad j = 1, ..., \nu \quad a \leq x \leq b, \qquad (1)$$

where $p_i(x), f(x)$ are polynomials of finite degree and g_j are some linear functionals acting on $y(x)$. The Operational approach of the Tau method is based on three simple operational matrices, that introduced by E. L. Ortiz and H. Samara in [4] and it was extend by S. Shahmorad et al. for numerical solution of a general class of integro-differential equations (see for example [5]).

Keywords: The Tau method, polynomial solutions, Matrix formulation.

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