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AN OPTIMIZED FOUR-STEP THREE-OFFGRID THIRD DERIVATIVE METHODS BASED ON THE VOLTERRA INTEGRAL EQUATION OF THE SECOND KIND FOR SOLVING THIRD ORDER INITIAL VALUE PROBLEMS

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ABSTRACT

In this article, an optimize four-step three off hybrid point third derivative method based on the Volterra integral equation of the second kind for solving third Order Ordinary Differential Equations, the method proposes an exponential function and power series as the basis function for a selected three hybrid points which suitably optimizes two of the off-grid points by equating the principal term of the local truncation error to zero and using the local truncation error to determine the approximate values of the unknown parameter, the basic properties of the method was scrutinize and the develop method of the Volterra integral equation of the second kind is apply to work out solve third order initial value problems of ordinary differential equations and from the numerical results obtained, it is observed that our new methods gives better approximation than the existing method compared.

***K*eywords** Optimize off-grid · Local Truncation error · Volterra integral equation · exponential function

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