

ADOMIAN DECOMPOSITION METHOD FOR NEUTRON DIFFUSION CALCULATIONS

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There is a vast amount of literature on mathematical methods for solving linear or nonlinear ordinary or partial differential equations, however, in order to apply these methods to problems arising in science and engineering, usually it is inevitable to make modifications to the original problem to have a certain form required by the particular method. Moreover, in most cases, a

high amount of computational power is required. The Adomian Decomposition Method (ADM), proposed by Adomian and modified by Wazwaz, has been proved useful in obtaining closed form or numerical approximations for the solutions of many such problems involved with algebraic, linear/non-linear, ordinary/partial differential equations, integro-differential, integral or differential delay equations while making it possible to avoid linearizations and modifications to the original problem which could correspond to unrealistic assumptions. Besides, the resulting computation schemes are efficient with high accuracy and generally a rapidly convergent series solution is achieved. Being motivated with these facts, in this work, we apply the ADM to solve neutron diffusion equations. We present both analytical and numerical results.