A New Spline Approximation for the Solution of One-space Dimensional Second Order Non-linear Wave Equations With Variable Coefficients

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Abstract: In this paper, we propose a new three-level implicit nine point compact finite difference formulation of order two in time and four in space directions, based on non-polynomial spline in compression for the solution of one-space dimensional second order non-linear hyperbolic partial differential equations with variable coefficients and significant first order space derivative term. We describe the Mathematical formulation procedure in details and also discussed the stability. Numerical results are provided to justify the usefulness of the proposed method.

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