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A computational method for solving the Lane-Emden initial value problems. (English)


Summary: In this work, we propose an efficient numerical algorithm based upon compact finite difference to solve Lane-Emden equations which are nonlinear ordinary differential equations. The presented method reduces the solution of Lane-Emden equations to the solution of a nonlinear system of equations. The numerical experiments show the accuracy and efficiency of this method.

MSC:
65L05 Numerical methods for initial value problems involving ordinary differential equations
65L12 Finite difference and finite volume methods for ordinary differential equations

Keywords:
Lane-Emden equation; singular IVPs; compact finite difference

Full Text: DOI

References:


[32] J.

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