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A higher order implicit method for numerical solution of singular initial value problems.

(English) [Zbl 1442.65128]


Summary: Recently a lower order implicit method has been presented for solving singular initial value problem. In this article a higher order implicit method has been developed to solve first or higher order problems having an initial singular point. This method is more suitable than second, third and two-stage fourth order implicit Runge-Kutta methods for first order problems. The method also provides significantly better results than the existing lower order implicit method for second order problems.

For the entire collection see [Zbl 1411.65007].

MSC:

65L06 Multistep, Runge-Kutta and extrapolation methods for ordinary differential equations
34A12 Initial value problems, existence, uniqueness, continuous dependence and continuation of solutions to ordinary differential equations

Keywords: singular initial value problems; implicit Runge-Kutta method; Lane-Emden-type equation; Emden-Fowler-type equation

Software: 

avalanche.f

Full Text: DOI

References:


[23] Jain, M.

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