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Choice of strategies for extrapolation with symmetrization in the constant stepsize setting

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Abstract

Symmetrization has been shown to be efficient in solving stiff problems. In the constant stepsize setting, we study four ways of applying extrapolation with symmetrization. We observe that for stiff linear problems the symmetrized Gauss methods are more efficient than the symmetrized Lobatto IIIA methods of the same order. However, for two-dimensional nonlinear problems, the symmetrized 4-stage Lobatto IIIA method is more efficient. In all cases, we observe numerically that passive symmetrization with passive extrapolation is more efficient than active symmetrization with active extrapolation.

Keywords

Extrapolation; Symmetrizers; Symmetrization; Gauss methods; Lobatto IIIA methods and stiff problems

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