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Linear multistep methods and Richardson extrapolation

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In this talk, we study the application the classical Richardson extrapolation (RE) technique to accelerate the convergence of sequences resulting from linear multistep methods (LMMs) for solving initial-value problems of systems of ordinary differential equations numerically. The advantage of the LMM-RE approach is that the combined method possesses higher order and favorable linear stability properties in terms of A- or $A(\alpha)$-stability, and existing LMM codes can be used without any modification.

This is a joint work with Lajos Lóczi (ELTE Eötvös Loránd University, Hungary and BME Budapest University of Technology and Economics, Hungary). The main results are based on the paper [1] and on an ongoing research project.

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[1] I. Fekete, L. Lóczi, Linear multistep methods and global Richardson extrapolation, *Appl. Math. Lett.*, **133**(2022), 108267.