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15. Numerical Analysis and Scientific Computing

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Some semilocal convergence theorems for Newton- and Chebyshev-like methods with applications to eigenproblems

Given $F : \mathbb{R}^n \to \mathbb{R}^n$, we study some iterative methods for approximating a solution of $F(x) = 0$ in the assumption that the derivatives of order higher than 3 of F are the null multilinear operators. We obtain some semilocal convergence theorems which can be applied for approximating an eigenpair (v, λ) of a matrix A. Some numerical examples are provided. These results constitute joint work with I. Păvăloiu. Reference. E. Cătinaş, I. Păvăloiu, *On Approximating the Eigenvalues and Eigenvectors of Linear Continuous Operators*, Revue d'Analyse Numérique et de Théorie de l'Approximation, **26** (1997) no.1-2, pp.19–27.