Solving nonlinear equations in R by a robust Aitken-Newton method

I. Pavaloiu, E. Catinas

Babes-Bolyai University

ABSTRACT

We present a new inverse interpolation method for solving nonlinear equations in R, based on the Hermite polynomial of degree 2.
The convergence order of the method is 8, as shown by a local convergence theorem.
Under certain conditions, the iterates converge monotonically to the solution, for initial approximations from (sided) convergence domains possible larger than the usual ball attraction sets.
The theory is illustrated by some numerical examples, which show in certain circumstances the advantage of this method over some optimal ones of same order.