

## **The Interval Symmetric Single-Step *ISSI* Procedure for Simultaneously Bounding Simple Polynomial Zeros**

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### **ABSTRACT**

The interval single-step procedure *ISI* established by Alefeld and Herzberger (1983) has been modified. The idea of Aitken (1950) and Alefeld (1977) is used to establish the interval symmetric single-step procedure *ISSI*. This procedure has a faster convergence rate than does *ISI*. In this paper, the convergence analysis of the procedure *ISSI* using interval arithmetic (Moore (1962, 1979), Alefeld and Herzberger (1983)) is shown. The procedure *ISSI* is considered as the interval version of the point symmetric single-step procedure *PSSI* Monsi (2010).

Keywords: Interval analysis, interval procedure, simultaneous inclusion, simple zeros,  $R$ -order of convergence,  $R$ -factor of a sequence.