

## **The Point Symmetric Single-Step Procedure for the Simultaneous Approximation of Polynomial Zeros**

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### **ABSTRACT**

The point single-step PS1 procedure established by Alefeld and Herzberger (1974) has  $R$ -order of convergence greater than 2. This method is modified by using the idea of Aitken (1950) and Alefeld and Herzberger (1974). The modified method PSS1 has a faster convergence rate. In this paper, the convergence analysis of the point symmetric single-step PSS1 is shown. The interval version of PSS1 (i.e. the interval symmetric single-step ISS1) is given in Monsi and Wolfe (1988). Computational results indicate that this method is more efficient than the total-step (Kerner (1966)) and the single-step (Alefeld and Herzberger (1974)) methods.

**Keywords:** Point procedure, simultaneous approximation, simple zeros,  $R$ -order of convergence.