ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

15. Numerical Analysis and Scientific Computing

1991 MS Classification: 39, 41, 65
Bozer, Mehmet, and Dosiyev, Adigezal, Eastern Mediterranean University, North Cyprus
The composite grids method of increased accuracy in Solving the mixed boundary value problem for the laplace equation
In this paper we develope the method of composite grids, which was proposed in [1]. The system of difference equations obtained, seperates into a fixed number of subsystems, each of which is adequate for the 9-point difference equations on a rectangle. A pasting together of the subsystems is carried out, effected by the constructed sixth-order interpolation. The whole system may be solved by the alternating method of Schwarz with the number of iterations $O(ln\epsilon^{-1})$, where ϵ is the prescirbed accuracy, by solving the standard difference equations of Laplace on rectangular domains at each iteration. The accuracy ot the scheme being considered for the number of nodes $O(h^{-2}lnh^{-1})$ equals $O(h^6)$, this estimate being obtained for requirements on the functions giving the boundary conditions which can not be essentially lowered in $C_{k,\lambda}$.
Reference: 1. E. A. Volkov, Tr. Mat. Inst. Steklov. 140 (1976), 68 - 102; English truns. in Proc. Steklov Inst. Math. 1970, no. 1 (140).