LOCAL AND PARALLEL FINITE ELEMENT ALGORITHMS FOR THE NAVIER-STOKES PROBLEM

摘要
关键词

分类号

Yinnian He(1),Jinchao Xu(2), Aihui Zhou(3)

(1)Faculty of Science, Xi'an Jiaotong University, Xi'an 710049, China,(2)Department of Mathematics, Penn State University, University Park, PA 16802, USA;(3)LSEC, ICMSEC, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing 100080, China

Abstract Based on two-grid discretizations, in this paper, some new local and parallel finite element algorithms are proposed and analyzed for the stationary incompressible Navier-Stokes problem. These algorithms are motivated by the observation that for a solution to the Navier-Stokes problem, low frequency components can be approximated well by a relatively coarse grid and high frequency components can be computed on a fine grid by some local and parallel procedure. One major technical tool for the analysis is some local a priori error estimates that are also obtained in this paper for the finite element solutions on general shape-regular grids.

通讯作者