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ETNA
Kent State University
etna@mcs.kent.edu

EXPERIENCES WITH NEGATIVE NORM LEAST–SQUARE METHODS FOR THE NAVIER–STOKES EQUATIONS*

P. BOCHEV†

Abstract. This paper is concerned with the implementation and numerical study of a discrete negative norm least-squares method for the Navier-Stokes equations proposed in [2] and [3]. The main focus of the paper is on the algorithmic development and computational analysis of this method, including design of efficient preconditioners, numerical estimates of convergence rates, etc. Our experiments indicate that the negative norm method yields results that are in agreement with the theoretical error estimates of [3] and compare favorably with the benchmark studies of [11].

Key words. Navier-Stokes equations, least-squares principle, finite element methods.

AMS subject classifications. 76D05, 76D07, 65F10, 65F30.

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†Department of Mathematics, Box 19408, University of Texas at Arlington, Arlington, TX 76019-0408, (bochev@utamat.uta.edu). This work was sponsored by the National Science Foundation under grant number DMS-9705793.