International Journal of Modern Physics C (IJMPC)

Computational Physics and Physical Computation

Just Accepted | **Current Issue** | **2011** | **2010** | **2009** | **All Volumes (1990-2011)**

Volume: 12, Issue: 7(2001) pp. 1023-1033 **DOI: 10.1142/S0129183101002309**

Abstract | **Full Text** (PDF, 255KB)

Title: **AN ITERATIVE NONUNIFORMLY SPACED FINITE DIFFERENCE SCHEME FOR COMPUTATIONAL FLUID DYNAMICS**

Author(s): ANDREAS HORRAS
Fachrichtung Theoretische Physik, Universität des Saarlandes, Postfach 15 11 50, 66041 Saarbrücken, Germany
GERALD H. RISTOW
Fachrichtung Theoretische Physik, Universität des Saarlandes, Postfach 15 11 50, 66041 Saarbrücken, Germany

History: Received 12 April 2001
Revised 19 June 2001

Abstract: The settling dynamics of cylinders in a viscous Newtonian fluid are investigated numerically using an iterative finite difference scheme, which uses a nonuniformly spaced staggered grid. Special attention is given to the details of the spatial discretization and how they influence the physical results. The terminal velocity is calculated for different system sizes and cylinder diameters and the extrapolated values for an infinite system size are compared with the Oseen approximation.

Keywords: Finite Difference Scheme; Nonuniformly Spaced Grid; Computational Fluid Dynamics; Sedimentation