

Hackbusch, W.; Kriemann, R.; Le Borne, S.; Maitre, J.-F.

CD2D3D – a package to solve convection-dominated problems employing ordering techniques. (English) [Zbl 1146.76630](#)

Hirschel, Ernst Heinrich (ed.), Numerical flow simulation II. CNRS-DFG collaborative research programme. Results 1998-2000. Berlin: Springer (ISBN 3-540-41608-0). Notes Numer. Fluid Mech. 75, 34-48 (2001).

Summary: Recently ordering techniques have been studied in connection with their influence on the multi-grid solution of convection dominant problems [*S. Le Borne*, Computing 64, No. 2, 123–155 (2000; [Zbl 0969.76072](#)); *T. Probst*, “Mehrgitterverfahren für Konvektionsdiffusionsgleichungen”, PhD thesis, University Kiel, dissertation.de, No. 100 (1999); *H. Rentz-Reichert*, “Robuste Mehrgitterverfahren zur Lösung der inkompressible Navier-Stokes Gleichung: Ein Vergleich”, PhD thesis, Institut für Computeranwendungen der Universität Stuttgart (1996)]. Due to its potential for general applications, in this paper we will detail the characteristics of the software developed to perform numerical tests for the proposed ordering and solution schemes given in [*Le Borne*, loc. cit.]. The purpose of this paper is twofold: Firstly, we show how ordering techniques can be incorporated in a complex software package developed for the solution of convection dominated partial differential equations, and secondly, we document the capabilities of the existing software and provide a general description of the employed data structures and interfaces so that users new to the package are able to easily experiment with the implemented ordering techniques or apply it to their own applications.

For the entire collection see [[Zbl 0995.00004](#)].

MSC:

- 76M25 Other numerical methods (fluid mechanics) (MSC2010)
- 76D05 Navier-Stokes equations for incompressible viscous fluids
- 76R99 Diffusion and convection

Software:

[CD2D3D](#)