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Foreword

Low Mach Number Flows Conference

Low Mach number flows represent a significant part of the various flows encountered in geophysics, industry or every day life. Paradoxically, the mathematical analysis of the equations governing these flows is difficult and on the practical side, the research of numerical algorithms valid for all flow speeds is continuing to be a challenge.

However, in the last decade, both from the theoretical and the numerical sides, significant progresses have been made in the understanding, analysis and approximation of the equations governing these flows.

This has motivated us to organize in June 21-25 2004 on the Porquerolles Island, an international conference in order to provide an up–to–date inventory of the recent mathematical and numerical results in the analysis of these flows. This special issue gathers some contributions from the papers presented at this conference. Their topics range from theoretical analysis of PDEs (contributions of S. Schochet, R. Danchin, D. Bresch *et al.*) to the design of numerical schemes (contributions of S. Dellacherie, E. Turkel *et al.*, R. Klein, and S. Roller *et al.*). This gives a good example of the fruitful interactions between mathematicians and numericists that this conference has generated. The conference also included a numerical workshop proposing to compute several challenging low Mach number flows. The results of this workshop are included in this volume as a testimony of 2004 state–of–the–art methods in the approximation of these flows (contributions of F. Beux *et al.*, S. Vincent *et al.*, P. Le Quéré *et al.* and H. Paillère *et al.*).

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