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Preface

Special issue on fluid–plate interactions

This special issue is the second in a series devoted to flow-induced vibrations, related to the 8th International Conference on Flow-Induced Vibrations (FIV2004) which was held in July 2004, in École Polytechnique, Palaiseau, France. Earlier versions of several of the papers in this issue were first presented in FIV2004.

The conference was a continuation of a very successful series, the first six of which were held in England (most at Keswick in the Lake District) and the seventh, in 2000, in Lucerne, Switzerland. The 9th conference is already in the planning phase and will be held in Prague in 2008. Since the first conference, held in Keswick in 1973, focused on the needs of the nuclear industry, the scope of papers has become progressively broader, addressing a wide range of practical applications and technical domains, ranging from civil engineering and marine structures to aeroelasticity and biomechanics. In this 8th conference, 160 papers were presented, with 210 participants from 30 countries. The breadth of applications is exemplified by the major headings of the topics covered, which included: *Fluid–structure interaction theory, Axial flow and thin walls, Tube arrays, Piping, gates and turbines, Flow-acoustic coupling, Two-phase flow, Computational methods, Biomechanics, Ship and offshore applications, Vortex induced vibration, Wings aeroelasticity, Wind-induced vibration, and Bluff bodies.* All papers have been published in the Proceedings available during the conference (E. de Langre & F. Axisa (editors) 2004, *Flow-Induced Vibrations.* École Polytechnique), and many appear, in updated and expanded versions, in the three special issues of this journal.

The seven papers in this special issue deal with unsteady interactions between plates and the adjacent fluid. Paper 1 presents computations of the stability of a cantilevered plate in viscous channel flow, as a model of the dynamics of the human upper airway. Paper 2 describes experiments and theory for understanding the stability of a long ribbon in axial flow, while paper 3 presents a theoretical model of a fluttering plate in a narrow passage. Paper 4 describes experiments on the hydrodynamic performance of a flapping foil, inspired by thunniform swimming. The flapping plate problem is studied computationally in paper 5, while paper 6 presents computations of the motion of a self-propelled fish-like body. Paper 7 describes experiments on the nonlinear flutter of an elastic rotating disk. These papers give a glimpse of the great variety of topics of interest in the realm of fluid–structure interactions with axial flow: some analytical, some experimental, and some numerical. A full range of practical applications, from the biomechanics of breathing and swimming to paper manufacture and the behaviour of compact disks, is also covered here.

The other two special issues of JFS related to FIV2004 are on the subjects of aeronautical/marine applications and cross-flow/bluff-body flows, respectively.

We take this opportunity to thank the authors for taking the time to update their FIV2004 presentations and the referees for their excellent reviews in extra-fast time, which has ensured the timely publication of this special issue.

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