



BOOK REVIEW

FLUID-STRUCTURE INTERACTIONS: SLENDER
STRUCTURES AND AXIAL FLOW. VOL. 1.

MICHAEL P. PAÏDOUSSIS

Academic Press, 1998

This book constitutes the first six chapters of what, with Volume II, is to be a text with a total of 13 chapters. The 6 chapters at hand comprise a careful and focused review of the central concern of the author's research for more than 3 decades: the problems of oscillation and general structural instability induced by the axial flow in and around pipes, the representative paradigmatic example being the "fire hose" or jet-follower instability problem.

While avoiding a claim of exhaustive treatment, the text does in fact offer a very detailed, thorough and exacting analytic and bibliographical coverage of many aspects of axial-flow pipe problems, certainly more than any other current text. The author comments that, while many of the problems posed have clearly arisen in practical contexts, there remains also a sector of "curiosity-driven" problems with their own intrinsic appeal. Overall, however, one could venture that the practical engineering penchant of the author surfaces sufficiently often to remind the reader of the text's already-proven practical utility.

The work, employing a sophisticated level of mathematical treatment of the fluid and structural mechanics problems involved, first offers a clear summary of the main tools that it calls upon. Following on, Chapters 3, 4 and 5 discuss detailed aspects of variously posed axial flow and closely related problems. These three chapters in particular are recommended by the author as indispensable to an understanding of the rest of the text.

A listing of the chapter headings may help the prospective reader:

1. Introduction; 2. Concepts, Definitions and Methods; 3 and 4. Pipes Carrying Fluid: Linear Dynamics I and II; 5. Pipes Carrying Fluid: Nonlinear and Chaotic Dynamics; 6. Curved pipes Carrying Fluid. In addition, 11 brief appendices discuss further basics, and experimental methods.

The work is clearly a labor of sustained dedication and care. The author has enlivened it in places with brief anecdotal material from practical situations. As he hints, he does not wish to risk boring the reader. He aims the text at engineers and applied mathematicians, especially researchers and practicing professionals. All of these should welcome it as an unusual, responsible, and highly valuable reference.

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