

1. Record Nr.	UNINA9910299857503321
Titolo	Flinovia - Flow Induced Noise and Vibration Issues and Aspects : A Focus on Measurement, Modeling, Simulation and Reproduction of the Flow Excitation and Flow Induced Response / / edited by Elena Ciappi, Sergio De Rosa, Francesco Franco, Jean-Louis Guyader, Stephen A. Hambric
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2015
ISBN	3-319-09713-X
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (364 p.)
Disciplina	532 533.62 620 620.1064
Soggetti	Fluid mechanics Continuum mechanics Acoustical engineering Engineering Fluid Dynamics Continuum Mechanics Engineering Acoustics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Introductory Lecture -- The Acoustics of Flow Over Rough Elastic Surfaces -- I.1 Spectral properties of wall-pressure fluctuations and their estimation from computational fluid dynamics -- I.2 Effect of developing pressure gradients on TBL Wall Pressure Spectrums -- I.3 Wall pressure fluctuations induced by supersonic TBL -- I.4 Turbulent surface pressure field in low speed flow -- I.5 Characterization of synthetic jet resonant cavities -- II.1 Source Scanning Technique for simulating TBL-induced vibrations measurements -- II.2 Experimental synthesis of spatially correlated pressure fields for the vibroacoustic testing of panels -- II.3 Identification of boundary pressure field exciting a plate under turbulent flow -- III.1 Turbulent flow-induced

self-noise and radiated noise in naval systems an industry point of view -- III.2 Vibroacoustics under aerodynamic excitations -- III.3 Discussion about different methods for introducing the turbulent boundary layer excitation in vibroacoustic models -- III.4 Dimensionless representations of the interaction between turbulent boundary layer and elastic plates -- III.5 Deterministic equivalent loads for reproducing the stochastic excitation and response -- III.6 A numerical methodology for resolving aeroacoustic-structural response of flexible panel -- III.7 Calculating structural vibration and stress from turbulent flow induced forces -- Appendix.

Sommario/riassunto

Flow induced vibration and noise (FIVN) remains a critical research topic. Even after over 50 years of intensive research, accurate and cost-effective FIVN simulation and measurement techniques remain elusive. This book gathers the latest research from some of the most prominent experts in the field. It describes methods for characterizing wall pressure fluctuations, including subsonic and supersonic turbulent boundary layer flows over smooth and rough surfaces using computational methods like Large Eddy Simulation; for inferring wall pressure fluctuations using inverse techniques based on panel vibrations or holographic pressure sensor arrays; for calculating the resulting structural vibrations and radiated sound using traditional finite element methods, as well as advanced methods like Energy Finite Elements; for using scaling approaches to universally collapse flow-excited vibration and noise spectra; and for computing time histories of structural response, including alternating stresses. This book presents the proceedings of the First International Workshop on Flow Induced Noise and Vibration (FLINOVIA), which was held in Rome, Italy, in November 2013. The authors' backgrounds represent a mix of academia, government, and industry, and several papers include applications to important problems for underwater vehicles, aerospace structures and commercial transportation. The book offers a valuable reference guide for all those working in the area of flow induced vibration and noise.
