1.	Record Nr.	UNINA9910817900803321
	Titolo	Laser velocimetry in fluid mechanics / / edited by Alain Boutier
	Pubbl/distr/stampa	London, : ISTE Hoboken, N.J., : John Wiley & Sons, 2012
	ISBN	1-118-56961-X 1-299-14788-7 1-118-56939-3
	Edizione	[1st ed.]
	Descrizione fisica	1 online resource (428 p.)
	Collana	Waves series
	Altri autori (Persone)	BoutierA (Alain)
	Disciplina	532
	Soggetti	Fluid dynamic measurements Fluid mechanics Laser Doppler velocimeter
	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 and index.
	Nota di contenuto	Cover; Laser Velocimetry in Fluid Mechanics; Title Page; Copyright Page; Table of Contents; Preface; Introduction; Chapter 1. Measurement Needs in Fluid Mechanics; 1.1. Navier-Stokes equations; 1.2. Similarity parameters; 1.3. Scale notion; 1.4. Equations for turbulent flows and for Reynolds stress tensor; 1.5. Spatial-temporal correlations; 1.6. Turbulence models; 1.6.1. Zero equation model; 1.6.2. One equation model; 1.6.3. Two equations model; 1.6.4. Reynolds stress models (RSM, ARSM); 1.7. Conclusion; 1.8. Bibliography; Chapter 2. Classification of Laser Velocimetry Techniques 2.1. Generalities2.2. Definitions and vocabulary; 2.3. Specificities of LDV; 2.3.1. Advantages; 2.3.2. Use limitations; 2.4. Application domain of laser velocimeters (LDV, PIV, DGV); 2.5. Velocity measurements based on interactions with molecules; 2.5.1. Excitation by electron beams; 2.5.2. Laser fluorescence; 2.5.3. Spectroscopy with a tunable laser diode in the infrared; 2.5.4. Coherent anti-Stokes Raman scattering technique; 2.5.5. Tagging techniques; 2.5.6. Summary; 2.6. Bibliography; Chapter 3. Laser Doppler Velocimetry; 3.1. Introduction; 3.2. Basic idea: Doppler effect 3.2.1. Double Doppler effect3.2.2. Four optical set-ups; 3.2.3.

Sommario/riassunto	In fluid mechanics, velocity measurement is fundamental in order to improve the behavior knowledge of the flow. Velocity maps help us to understand the mean flow structure and its fluctuations, in order to further validate codes.Laser velocimetry is an optical technique for velocity measurements; it is based on light scattering by tiny particles assumed to follow the flow, which allows the local fluid flow velocity and its fluctuations to be determined. It is a widely used non-intrusive technique to measure velocities in fluid flows, either locally or in a map. This book presents