

1. Record Nr.	UNINA9910437762303321
Autore	Astarita Tommaso <1969.>
Titolo	Infrared thermography for thermo-fluid-dynamics // Tommaso Astarita, Giovanni Maria Carlomagno
Pubbl/distr/stampa	Heidelberg, : Springer, 2012, c2013
ISBN	1-283-62713-2 9786613939586 3-642-29508-8
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (236 p.)
Collana	Experimental fluid mechanics
Altri autori (Persone)	CarlomagnoG. M
Disciplina	621.40210287
Soggetti	Thermography Infrared imaging Heat - Convection Heat - Transmission Fluid dynamics Thermodynamics
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	Infrared Thermography for Thermo-Fluid-Dynamics; Preface; Editorial; Contents; Symbols; 1...Introduction and historical grounding; 1.1... Introduction; 1.2...Historical grounding; 2...Physical background; 2.1... Basic radiation heat transfer theory; .1.0 2.1.1...Black bodyXE "radiationblack body" radiation; .1.0 2.1.2...Radiation of real bodies; . 1.0.0 2.1.2.1...Dielectric materials; .1.0.0 2.1.2.2...Electrically conducting materials; .1.0 2.1.3...Atmospheric atmospherictransmissiontransmittance; 3...IR Scanner; 3.1...Optical system; .1.0 3.1.1...Lens and windows; .1.0 3.1.2...Scanning mechanism 3.2...IR temperature detector.2.0 3.2.1...Thermal detectors; .2.0 3.2.2... Photon detectors; .2.0 3.2.3...Cooling system; .2.0 3.2.4...Performance of infrared detectors; 3.3...Electronic processor and signal conditioner; 3.4...IR scanner XE "performancecamera"performance; .4.0 3.4.1... Thermal sensitivity; .4.0 3.4.2...Spatial resolution; .4.0 3.4.3... Acquisition frequency; .4.0 3.4.4...Temperature and dynamic ranges; .

4.0 3.4.5...Choice of IR working band; 3.5...IR scanner
radiometric calibration radiometric calibration; 4...Heat Flux sensors;
4.1...Heated thin foil heated thin foil sensor sensor

Sommario/riassunto

Infrared thermography is a measurement technique that enables to obtain non intrusive measurements of surface temperatures. One of the interesting features of this technique is its ability to measure a full two dimensional map of an object surface temperature and, for this reason, it has been widely used as a surface flow visualization technique. Since the temperature measurements can be extremely accurate, it is possible, by using a heat flux sensor, also to measure convective heat transfer coefficient distributions on a surface, making the technique de facto quantitative. This book, starting from the basic theory of radiation and heat flux sensors, guides, both the experienced researcher and the young student, in the correct application of this powerful technique to study convective heat transfer problems. A significant number of examples and applications are also examined in detail, often pointing out some relevant aspects.
