1.	Record Nr.	UNINA9910373957103321
	Titolo	Measurement of Nonlinear Ultrasonic Characteristics [[electronic resource] /] / edited by Kyung-Young Jhang, Cliff J. Lissenden, Igor Solodov, Yoshikazu Ohara, Vitalyi Gusev
	Pubbl/distr/stampa	Singapore : , : Springer Singapore : , : Imprint : Springer, , 2020
	ISBN	981-15-1461-5
	Edizione	[1st ed. 2020.]
	Descrizione fisica	1 online resource (X, 287 p.)
	Collana	Springer Series in Measurement Science and Technology, , 2198-7807
	Disciplina	620.11274
	Soggetti	Physical measurements Measurement Materials science Acoustics Measurement Science and Instrumentation Characterization and Evaluation of Materials
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	Preface -- Chapter 1. Overviews: Nonlinear Ultrasonic Characteristics and Measurands -- Chapter 2. Elastic Nonlinearity induced Nonlinear Ultrasonic Characteristics -- 2.1 Higher Harmonics (HH) Generation, -2.2 Nonlinear Ultrasonic Parameters -- 2.2.1 Absolute Nonlinear Ultrasonic Parameter -- 2.2.2 Relative Nonlinear Ultrasonic Parameter -- 2.3 Measurement of Nonlinear Ultrasonic Parameter -- 2.3.1 Capacitive Detection and Laser-interferometric Detection -- 2.3.2 Piezo-electric Detection -- 2.3.3 Control of Propagation Distance and Control of Incident Wave Power -- 2.3.4 Phase Inversion Technique -- 2.4 Factors Affecting to Measurement Reliability -- 2.4.1 Measurement System: Transducer, Input Power, Contact Pressure, Electronic Equipment -- 2.4.2 Digital Signal Processings: Bandwidth of Incident Wave, Time Resolution, Amplitude Resolution -- 2.5 Applications to Assessment of Material Damage -- 2.5.1 Fatigue Damage -- 2.5.2 Plastic Deformation -- 2.5.3 Thermal Aging -- References -- Chapter 3. Nonlinear Acoustic Wave Interactions with Contact Interfaces: Methodologies and Applications -- 3.1. Nonlinear Reflection Approach

| Sommario/riassunto | Conventional ultrasonic methods based on ultrasonic characteristics in the linear elastic region are mainly sensitive to mature defects but are much less responsive to micro-damage or incipient material degradation. Recently, nonlinear ultrasonic characteristics beyond the linear ultrasonic amplitude range have been studied as a method for overcoming this limitation, and hence, many researchers are engaged |

in theoretical, experimental, and various application studies. However, the nonlinear ultrasonic characteristics are quite exacting compared to the linear phenomena so that they require vast experience and high proficiency in order to obtain proper experimental data. Actually, many researchers, especially beginners including graduate students, have difficulty in reliably measuring nonlinear ultrasonic characteristics. This book provides key technological know-how from experts with years of experience in this field, which will help researchers and engineers to obtain a clear understanding and high quality data in the nonlinear ultrasonic experiments and applications.