## Contents

OPENING LECTURE	4
Necessity of Elastic Waves Modeling in Ultrasonic NDT Applications	. 5
ELASTIC WAVE MODELLING AND NUMERICAL SIMULATIONS Study of finite differences simulations of the ultrasound propagation in christensen's	7
$\operatorname{media}$	
Stress waves and pitfalls in their finite element modelling	. 10
integration techniques in Cartesian and curvilinear co-ordinates	. 13
Threshold phenomenon and homogenization in highly heterogenous elastic material.	
Wave profile distortion and NDT of inhomogeneously predeformed material	. 15
Surface wave propagation in a gradient elastic medium with surface energy	. 16
Implementation of absorption in elastic wavefield modeling	. 17
Propagation of elastic waves in prestressed media	. 18
Grid dispersion in harmonic surface (edge) wave modelling	. 19
Modelling of acoustic wave propagation in waveguides by numerical approaches	. 20
Detection of nonlinear inclusion: pulse reflection from nonlinear layer and transmis-	
sion through it	. 21
Elastic Wave Scattering on Thin Elastic Inclusion	
(D1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
The stability of Viscoplastic Extension of a Rectangular Strip	. 23
NON-LINEAR EFFECTS & NDE TECHNIQUES	. 23 24
	24
NON-LINEAR EFFECTS & NDE TECHNIQUES	. 25
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	. 25 . 26
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	. 24 . 25 . 26
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	24 . 25 . 26 . 27
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	24 . 25 . 26 . 27 . 28
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	24 . 25 . 26 . 27 . 28
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	24 . 25 . 26 . 27 . 28
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	24 . 25 . 26 . 27 . 28 . 29
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	24 . 25 . 26 . 27 . 28 . 29
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	24 . 25 . 26 . 27 . 28 . 32 . 32 . 32
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	$\begin{array}{c} 24 \\ 25 \\ 26 \\ 27 \\ 28 \\ 29 \\ 31 \\ 32 \\ 32 \\ 33 \\ 34 \\ 34 \\ 34 \\ 34 \\ 34$
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	$\begin{array}{c} 24 \\ 25 \\ 26 \\ 27 \\ 28 \\ 29 \\ 31 \\ 32 \\ 32 \\ 33 \\ 34 \\ 34 \\ 34 \\ 34 \\ 34$
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	. 24 . 25 . 27 . 28 . 32 . 32 . 33 . 34 . 35
NON-LINEAR EFFECTS & NDE TECHNIQUES  Phenomenology and modeling of damaged mesoscopic materials	. 24 . 25 . 26 . 27 . 36 . 37 . 37 . 37

AC	COUSTIC EMISSION TREATMENT	40
	AE source characterization by atomistic simulations	41
	Physical models of acoustic emission sources - A review	42
	Artificial Neural Network Algorithms for Acoustic Emission Events Location	43
	Rihaczech Transform to Analysis of Burst Type of Acoustic Emission Signals	44
	Analysis of Burst Type of Acoustic Emission Signals by Discrete Wavelet Transform	45
	Frequency Properties of Wavelets Used in Ultrasonic Signal Analysis	46
	Probabilistic and Neural Network Classification of Simulated AE Data	4'
	Modal Analysis of Acoustic Emission in Structural Steel Components	48
	Numerical Simulation and Experimental Evaluation of AE-signals Resulting from	
	Matrix Crack Growth in Composites	49
	Control of the metals of steam lines in conditions of operations by method of acoustic	
	emission	5(
	Low-cycle fatigue of steels in processing by an electric current	5.