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PREFACE

This number is dedicated to four issues concerning the defects identification in micropolar materials, the non-surgical applications of liver tumor, the non-dispersive media and the chalcogenide materials.

The micropolar nonlinear wave theory is used in the first article to develop an inverse approach for capturing the size and location of inhomogeneities embedded into a micropolar material. The authors specify that the natural frequencies of a structure represent its signature of the dynamic behaviour, and any defect or change into the internal structure of the material is *felt* by the vibrations in the sense of modifying their natural frequencies. Based on the analysis of the interrelations between natural frequencies and the structure of the material, an unconstrained minimization algorithm is built by minimization of the least square distance between computed and measured natural frequencies.

The second article presents a robotic-assisted liver tumor therapy by targeted delivery of drugs into the tumor. This procedure is applied in the case of nonresectable tumors. It is difficult for the surgeon to perform by himself the surgical plan because of some major difficulties which may occur during the procedure, such as the insertion trajectory of the needle can touch the ribs, blood vessels and other tissues and organs in the vicinity of the liver, or the inserted needle may cause deformation of liver which can change the map of the tumor surroundings.

A discussion on the Seymour and Varley results is the objective of the next article. The article analyses certain media whose responses are governed by the nonlinear nondispersive wave equation, in which any two pulses traveling in opposite directions interact nonlinearly for a finite time when they collide but then part unaffected by the interaction.

Next article is devoted to the Coulomb vibrations in the motion of the double pendulum. The pendulum`s interest is associated to mechanical clocks, the metronomes and seismometers. The linear equivalence method (LEM) formulated by Toma (1995) is applied to define the Coulomb vibration as a particular solution of the nonlinear system of equations that describes the pendulum motion.

The chalcogenide ternary thin films chalcogenide glasses is the subject of the last article. These materials offer a new range of infrared transmitting materials to the designer and this review attempts to bring together the currently available data on these glasses. Information is presented on glass preparation, composition, softening temperature, thermal expansion, viscosity, chemical durability, mechanical properties, electrical properties, infrared transmission, refractive index and absorption coefficient, with particular emphasis on infrared transmission.

The guest editor, Nicoleta NEDELCU, would like to thank all authors and co-authors for their contributions to this special issue. In addition, we would like to thank the reviewers for their valuable comments, which have led to increased quality of this issue.

Editors