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PREFACE

Scientifically, the simulation of elastic waves motion along pipelines, the dynamic of the left ventricle, the dilatation acceleration waves in porous materials, the closed-form solutions for two body problem in rotating reference frame and the damping of elastomeric antiseismic and antivibration systems, are important issues in mathematical and computational models of heterogeneous engineering and fundamental information in dynamics. Thus, such tools are now routinely used in the theoretical and experimental systematic investigation of engineering systems.

The ultrasonic technique is an efficient tool for nondestructive inspection of pipelines and evaluation of flaws of different size and geometry, present in pipelines such as corrosion and cracks need extensive examination of ultrasonic wave propagation phenomena. The first paper in this issue is applying two simulation techniques to analyze the wave propagation in pipelines.

The second issue is applying the cnoidal method to study the dynamics of the left ventricle. The left ventricle is a mixture of muscle and collagen fibers, coronary vessels, coronary blood and the interstitial fluid, so that its behavior results from a contractile motion of the muscle cells.

Next two issues are dedicated to a porous thermoelastic material with voids having a micropolar structure and to the derivation of a closed-form solution to the two-body problem in rotating non-inertial reference frames. The closed-form solutions for the motion in the non-inertial frame, the motion of the mass center, and the relative motion are presented. Dynamical characteristics similar to linear momentum, angular momentum, and total energy are introduced.

Owing to the large variety of the existing elastomers based on natural rubber and chemical additives improving the assembly elasticity or plasticity, the last issue discusses a well-known method for testing and qualification the elasticity as well as the damping for antiseismic and antivibration systems. This paper presents two cases regarding elastomer systems behaving according to the linear viscoelastic law or the hysteretic law, being independent in respect to the excitation frequency.

The guest editor, Ligia MUNTEANU, 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