

Editorial

Editorial for the Special Issue Dedicated to Professor J.N. Reddy

Nicholas Fantuzzi ^{1,*}, Michele Baccocchi ², Eugenio Ruocco ³, Maria Amélia Ramos Loja ^{4,5}
and Jose Antonio Loya ⁶

- ¹ Department of Civil, Chemical, Environmental, and Materials Engineering, University of Bologna, Viale del Risorgimento 2, 40136 Bologna, Italy
 - ² DESID Department, University of San Marino, Via Consiglio dei Sessanta, 99, 47891 Dogana, San Marino; m.baccocchi1@unirmsm
 - ³ Engineering Department, University of Campania “L. Vanvitelli”, Via Roma 28, 81100 Caserta, Italy; eugenio.ruocco@unicampania.it
 - ⁴ CIMOSM—Centro de Investigação e Otimização de Sistemas Multifuncionais, ISEL, IPL—Instituto Politécnico de Lisboa, Av. Conselheiro Emídio Navarro 1, 1959-007 Lisboa, Portugal; amelia.loja@isel.pt
 - ⁵ IDMEC, Instituto Superior Técnico, Universidade de Lisboa, Avenue Rovisco Pais, 1, 1049-001 Lisboa, Portugal
 - ⁶ Department of Continuum Mechanics and Structural Analysis, University Carlos III of Madrid, Avda. de la Universidad, 30, Leganés, 28911 Madrid, Spain; jloya@ing.uc3m.es
- * Correspondence: nicholas.fantuzzi@unibo.it

This Special Issue of *Mathematical and Computational Applications* is devoted to innovative mathematical and computational approaches in applied mechanics and is dedicated to Professor J.N. Reddy (Texas A&M University). Professor Reddy has been a towering figure in theoretical and computational mechanics, especially through his development of the third-order shear deformation theory for beams, plates, and shells (often known as “Reddy’s theory”), as well as his work on layer-wise models, nonlinear finite element formulations, and key textbooks. His vision has continuously bridged rigorous mathematics and engineering applications, and his legacy provides motivation for much of the current research in this domain.

We prepared this Editorial both to acknowledge Professor Reddy’s enduring influence and to offer readers a synopsis of the articles collected in this issue. Saber et al. [1] analyze the dynamic behavior of light bridges under moving loads within the context of vibration control and structural integrity. The Authors introduce the effectiveness of nonlinear semi-active absorbers in mitigating bridge vibrations. Saadatmorad et al. [2] introduce a mode shape projection method to improve damage detection in laminated composite plates, overcoming some of the edge effects inherent in wavelet methods.

Nava and Kim [3] developed a nonlinear finite element model for circular and annular micro-plates under thermal and mechanical loading considering a third-order shear deformation theory, where the effects of material and porosity distributions were analyzed.

Fahmy and Toujani [4] present a fractional boundary element formulation for 3D thermal stress wave propagation in anisotropic materials, employing Caputo derivatives and efficient solvers. Karami and Ghayesh [5] investigate the forced vibration behavior of graphene origami-enabled auxetic metamaterial beams with elastic constraints, showing how folding geometry and foundation stiffness influence dynamic response. Sofiyev et al. [6] address the buckling of axially loaded laminated nanocomposite cylindrical shells under thermal and mechanical loading, using an extended shear deformation theory framework. Mahtabi et al. [7] propose a polynomial approximation method over arbitrary shaped domains using SVD-based Vandermonde manipulations to determine interpolation or modal points. Carvalho et al. [8] quantify how uncertainty in carbon



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nanotube geometry and material parameters propagates into deflection predictions for functionally graded plates. Kurpa et al. [9] apply R-function theory within a Ritz framework to handle the free vibration of porous functionally graded plates of variable thickness on elastic foundations. Loya et al. [10] examine the buckling of cracked Euler–Bernoulli columns embedded in a Winkler medium, analyzing the influence of crack location and stiffness. Murillo et al. [11] present a finite element implementation of Reddy’s third-order beam theory for the thermal–structural analysis of functionally graded beams. Finally, Apalak and Reddy [12] analyze thermal stress formation in a functionally graded Al_2O_3 -adhesive single lap joint under uniform temperature, showing how the gradient index moderates interface stresses.

We believe that this Special Issue showcases the potential of the interplay between mathematical finesse and computational implementation in modern applied mechanics. It honours Professor Reddy’s enduring inspiration and highlights promising future directions inspired by his legacy.

Conflicts of Interest: The authors declare no conflicts of interest.

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