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ABSTRACT

A Physically Sound Approach to Non-Linear Structural Mechanics

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Structural analysis of continua undergoing large displacements and deformations is addressed. This topic is nowadays of ever increasing importance in innovative engineering applications. A wide spectrum of disciplines, spanning from nano-mechanics, electro-mechanics and biomechanics is involved. Practical applications are of utmost interest for industrial design and production of sensors, actuators, composites, soft tissues, compliant electronic devices and mechanisms at different scales. To get a consistent analysis, a reformulation of basic notions and methodologies of current usage in structural mechanics is self-proposing. The brand-new geometric approach addresses and discusses issues, paradoxes and applicative difficulties in Non-Linear Structural Mechanics. Both theoretical and computational perspectives are taken into account [1].

[1] G. Romano and R. Barretta, Advancements in Continuum Mechanics and Electrodynamics by a spacetime geometric approach, Acta Mech, 235, 4357-4399 (2024).