

**ADVANCES IN CLASSICAL AND NON-CLASSICAL FEM  
FORMULATIONS APPLIED TO STRUCTURAL COMPUTATIONAL  
MODELING OF COMPOSITE MATERIALS**

900

**AREF K. L. KZAM<sup>\*</sup>, FABIO C. ROCHA<sup>†</sup>  
AND MARIA S. M. SAMPAIO<sup>#</sup>**

<sup>\*</sup> Federal University of Latin American Integration  
Tancredo Neves Avenue, 6731, 85867-970, Foz do Iguaçu – Paraná –Brazil  
aref.kzam@unila.edu.br

<sup>†</sup> Federal University of Sergipe  
Marechal Random Avenue, S/N, 49100-100, Sergipe – Aracaju – Brazil  
fcrocha@ufs.br

<sup>#</sup> Lutheran University of Brazil  
Carlos Drummond de Andrade Avenue, 1460, 69077-730 – Manaus – Amazonas – Brazil  
socorrosampaio@hotmail.com

**Key words:** Computational Methods, Structural Analysis, Computational Mechanics, Composite Materials.

**ABSTRACT**

The increased application of composite materials in many structures and devices has generated much research to predict their pre and post-critical behaviour applied to various branches of engineering as, for example, civil, mechanical, medical, aeronautic, aerospace and mechatronics. Despite its importance, some difficulties and challenges are still present regarding its numerical simulation. The scope of this mini-symposium covers the advances in research and applications of technologies for mathematical and numerical models used in the description of composite materials by means of the finite element method in its classical or unconventional formulations. The topics of interest for this mini-symposium include, but not limited to, applications in the various fields of solids mechanics and structures, material properties determination, optimization, stress and strain analysis, nonlinear analysis, linear and nonlinear dynamics analysis, structural instability, amongst other.

**REFERENCES**

- [1] M.S.M. Sampaio, R.R. Paccola and H.B. Coda, “A geometrically nonlinear FEM formulation for the analysis of fiber reinforced laminated plates and shells”, *Composite Structures*, Vol. **119**, pp. 799–814, (2015).
- [2] R.R. Paccola, M.S.M. Sampaio and H.B. Coda, “Continuous stress distribution following transverse direction for FEM orthotropic laminated plates and shells”, *Applied Mathematical Modelling*, Vol. **40**, pp. 7382–7409, (2016).