

Workshop APPLIED MATHEMATICS: METHODS AND MODELING  
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**About symmetries, pseudosymmetries and conservation laws in  
Lagrangian and Hamiltonian  $k$ -symplectic formalisms**

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**Abstract:** The  $k$ -symplectic formalism is a generalization to field theories of the standard symplectic formalism in autonomous Mechanics, which is the geometric framework for describing autonomous dynamical systems. This formalism is based on the polysymplectic formalism developed by Günther in 1987. The  $k$ -Symplectic Geometry provides the simplest geometric framework for describing certain class of first-order classical field theories.

The purpose of this talk is to present Lagrangian and Hamiltonian  $k$ -symplectic formalisms. Further, we will recall the notions of symmetry, conservation law and relationship between this in the framework of  $k$ -symplectic geometry and we will introduce the notion of pseudosymmetry as a natural extension of symmetry. Without the help of a Noether type theorem, using only symmetries and pseudosymmetries, we will obtain new kinds of conservation laws for  $k$ -symplectic Hamiltonian systems and  $k$ -symplectic Lagrangian systems.