ANDREA DZIUBEK, SUNY Poly, Utica, NY

Literature Review of Structure Preserving Discretizations for Shell Models

With their interconnection of differential geometry and continuum mechanics, shell models are a natural place to study covariant discretization methods of metric dependent operators. Research in the area of exterior calculus based computational methods for elasticity is currently very active and recent progress has been made on the discrete counterparts of a connection, the covariant derivative, and the stress-tensor (a co-vector-valued two-form), which are essential operators in elasticity. However, a covariant discretization of shells is not yet formulated. A starting point is to formulate shell equations in the language of exterior calculus (differential forms).

We will review shell models and discuss some of the issues of structure-preserving discretizations of shell equations.