

Tuesday, Oct. 27 at 9:30 am:

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Title: "The role of curl-type involution constraints in continuum mechanics"

Abstract:

In the non-linear elasticity, the curl of the distortion field has to vanish. However, if this involution constraint is violated, we show that a more general class of hyperbolic continuum mechanics models emerges which can be applied to the modeling of turbulence, dispersive solids, or modeling of residual stresses in growing tissues or solidified materials. Such models being formulated as a system of first-order hyperbolic equations require a special structure-preserving numerical integration because the stationary curl-constraint becomes a true evolutionary equation that has to be integrated in a compatible way with the other equations.