Analysis of Soft Fibers with Kinematic Constraints and Cross-Links by Finite Deformation Beam Theory

Franck Vernerey[1] and Ronald Y. S. Pak[2]

Abstract: This paper presents a hybrid analytical-computational mechanics formulation for an arbitrarily curved Timoshenko beam undergoing planar finite deformation and subjected to kinematic constraints in the form of fixed displacement and cross-linking. On the basis o an analytical reduction of the governing equations, the system reduced to a single nonlinear differential equation coupled with integr