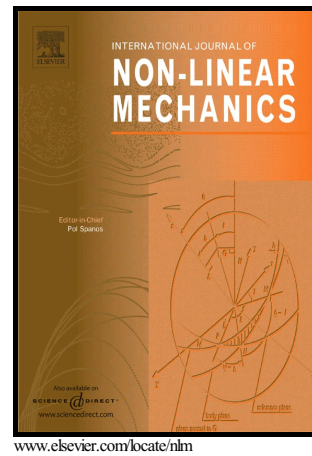


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# Blowup of Solutions for the Planar Motions of Rotating Nonlinearly Elastic Rods

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This paper is dedicated to Giuseppe Rega and Fabrizio Vestroni on the occasions of their 70th birthday anniversaries.

## Abstract

This paper treats the motion of flexible, extensible, shearable nonlinearly elastic rods, described by a geometrically exact theory, when they are confined to a plane rotating about a fixed axis at constant angular speed and when they are confined to a fixed plane with one end rotating at a constant angular speed about an axis perpendicular to the fixed plane. The paper gives restrictions on the constitutive equations and initial conditions that ensure that motions become unbounded at rapid rates as time becomes infinite. The analysis of these constitutive restrictions employs the theory of characteristics for single first-order semilinear partial differential equations.

Keywords: nonlinear elasticity, rotational motions, blowup

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