



Mathematical Models of Beams and Cables

Angelo Luongo, Daniele Zulli

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DESCRIPTION

Nonlinear models of elastic and visco-elastic onedimensional continuous structures (beams and cables) are formulated by the authors of this title. Several models of increasing complexity are presented: straight/curved, planar/non-planar, extensible/inextensible, shearable/unshearable, warpingunsensitive/ sensitive, prestressed/unprestressed beams, both in statics and dynamics. Typical engineering problems are solved via perturbation and/or numerical approaches, such as bifurcation and stability under potential and/or tangential loads, parametric excitation, nonlinear dynamics and aeroelasticity.

Contents

1. A One-Dimensional Beam Metamodel.
2. Straight Beams.
3. Curved Beams.
4. Internally Constrained Beams.
5. Flexible Cables.
6. Stiff Cables.
7. Locally-Deformable Thin-Walled Beams.

8. Distortion-Constrained Thin-Walled Beams.

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