1. Record Nr. UNINA9910714158303321

Autore	Grosshandler William
Titolo	Transient application, recirculating pool fire, agent effectiveness screen : final report, NGP project 3A/2/890 / / William Grosshandler; Anthony Hamins; Kevin McGrattan; Cary Presser
Pubbl/distr/stampa	Gaithersburg, MD : , : U.S. Dept. of Commerce, National Institute of Standards and Technology, , 2001
Descrizione fisica	1 online resource
Collana	NISTIR ; ; 6733
Altri autori (Persone)	GrosshandlerWilliam HaminsAnthony McGrattanKevin B PresserC
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	2001. Contributed record: Metadata reviewed, not verified. Some fields updated by batch processes. Title from PDF title page.
Nota di bibliografia	Includes bibliographical references.

2. Record Nr. UNINA9910807702703321

Autore	Luongo Angela
Titolo	Mathematical models of beams and cables / / Angelo Luongo, Daniele Zulli ; series editor, Noel Challamel
Pubbl/distr/stampa	London, England ; ; Hoboken, New Jersey : , : Wiley, , 2013 ©2013
ISBN	1-118-57755-8 1-118-57763-9 1-118-57764-7
Descrizione fisica	1 online resource (379 p.)
Collana	Mechanical engineering and solid mechanics series
Altri autori (Persone)	ChallamelNoel
Disciplina	624.1772
Soggetti	Structural analysis (Engineering) - Mathematical models Girders Cables
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Title page; Contents; Preface; Introduction; List of Main Symbols; Chapter 1. A One-Dimensional Beam Metamodel; 1.1. Models and metamodel; 1.2. Internally unconstrained beams; 1.2.1. Kinematics; 1.2.2. Dynamics; 1.2.3. The hyperelastic law; 1.2.4. The Fundamental Problem; 1.3. Internally constrained beams; 1.3.1. The mixed formulation for the internally constrained beam kinematics and constraints; 1.3.2. The displacement method for the internally constrained beam; 1.4. Internally unconstrained prestressed beams; 1.4.1. The nonlinear theory; 1.4.2. The linearized theory 1.5. Internally constrained prestressed beams1.5.1. The nonlinear mixed formulation; 1.5.2. The linearized mixed formulation; 1.5.3. The nonlinear displacement formulation; 1.5.4. The linearized displacement formulation; 1.6. The variational formulation; 1.6.1. The total potential energy principle; 1.6.2. Unconstrained beams; 1.6.3. Constrained beams; 1.6.4. Unconstrained prestressed beams; 1.6.5. Constrained prestressed beams; 1.7. Example: the linear Timoshenko beam; 1.8. Summary; Chapter 2. Straight Beams; 2.1. Kinematics; 2.1.1. The displacement and rotation fields

2.1.2. Tackling the rotation tensor2.1.3. The geometric boundary conditions; 2.1.4. The strain vector; 2.1.5. The curvature vector; 2.1.6. The strain-displacement relationships; 2.1.7. The velocity and spin fields; 2.1.8. The velocity gradients and strain-rates; 2.2. Dynamics; 2.2.1. The balance of virtual powers; 2.2.2. The inertial contributions; 2.2.3. The balance of momentum; 2.2.4. The scalar forms of the balance equations and boundary conditions; 2.2.5. The Lagrangian balance equations; 2.3. Constitutive law; 2.3.1. The hyperelastic law 2.3.2. Identification of the elastic law from a 3D-model2.3.3. Homogenization of beam-like structures; 2.3.4. Linear viscoelastic laws; 2.4. The Fundamental Problem; 2.4.1. Exact equations; 2.4.2. The linearized theory for elastic prestressed beams; 2.5. The planar beam; 2.5.1. Kinematics; 2.5.2. Dynamics; 2.5.3. The Virtual Power Principle; 2.5.4. Constitutive laws; 2.5.5. The Fundamental Problem; 2.6. Summary; Chapter 3. Curved Beams; 3.1. The reference configuration and the initial curvature; 3.2. The beam model in the 3D-space; 3.2.1. Kinematics; 3.2.2. Dynamics; 3.2.3. The elastic law
3.2.4. The Fundamental Problem3.3. The planar curved beam; 3.3.1. Kinematics; 3.3.2. Dynamics; 3.3.3. The Virtual Power Principle; 3.3.4. Constitutive law; 3.3.5. Fundamental Problem; 3.4. Summary; Chapter 4. Internally Constrained Beams; 4.1. Stiff beams and internal constraints; 4.2. The general approach; 4.3. The unshearable straight beam in 3D; 4.3.1. The mixed formulation; 4.3.2. The displacement formulation; 4.4. The unshearable straight planar beam; 4.5. The inextensible and unshearable straight beam in 3D; 4.5.1. Hybrid formulation: Version I; 4.5.2. Hybrid formulation: Version II
4.6. The inextensible and unshearable straight planar beam

Sommario/riassunto

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 aeroelasticit