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Volume 50, Issue 9, Pages 1193-1506 (1 May 2013)

The effect of small scale on the pull-in instability of nano-switches using DQM

Original Research Article

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Progressive failure of a unidirectional fiber-reinforced composite using the method of cells: Discretization objective computational results

Original Research Article

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Evan J. Pineda, Brett A. Bednarcyk, Anthony M. Waas, Steven M. Arnold

Predeformation- and frequency-dependent material behaviour of filler-reinforced rubber: Experiments, constitutive modelling and parameter identification

Original Research Article

Pages 1217-1225

D. Wollscheid, A. Lion

Highlights

► Predeformation- and frequency-dependence of filled rubber is experimentally studied. ► Large predeformations are superimposed by small harmonic vibrations. ► Dynamic moduli exhibit a strong dependence on predeformation and frequency. ► A new constitutive approach to describe the dynamic material behaviour is developed. ► Parameter identification is carried out and simulation results are excellent.

Steady-state solutions of a propagating borehole

Original Research Article

Pages 1226-1240

Luc Perneder, Emmanuel Detournay

Discrete approximations of the Föppl–Von Kármán shell model: From coarse to more refined models

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Cohesive fracture of plane orthotropic layers
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On the stress–force–fabric relationship for granular materials
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Strain energy change to the insertion of inclusions associated to a thermo-mechanical semi-coupled system
Original Research Article
Pages 1303-1313
S.M. Giusti, A.A. Novotny, J.E. Muñoz Rivera, J.E. Esparta Rodriguez

Highlights
► Topological derivative of a semi-coupled thermo-mechanical system. ► Novel, extremely simple closed formula for the topological sensitivity. ► Full mathematical justifications for the obtained formulas. ► Potential applications to topology design of structural components and thermal actuators.

Experimental real-time tracking and diffusion/mechanics numerical simulation of cavitation in gas-saturated elastomers
Original Research Article
Pages 1314-1324
Julien Jaravel, Sylvie Castagnet, Jean-Claude Grandidier, Mikaël Gueguen

Dislocation simulation of domain switching toughening in ferroelectric ceramics
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A Morphing framework to couple non-local and local anisotropic continua
Original Research Article
Pages 1332-1341
Yan Azdoud, Fei Han, Gilles Lubineau

Analysis and optimal design of layered composites with high stiffness and high damping

Original Research Article

Pages 1342-1353

Julien Meaud, Trisha Sain, Gregory M. Hulbert, Anthony M. Waas

A discrete network model for bond failure and frictional sliding in fibrous materials

Original Research Article

Pages 1354-1363

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Cavitation instabilities in bulk metallic glasses

Original Research Article

Pages 1364-1372

X. Huang, Z. Ling, L.H. Dai

Mechanical modeling of helical structures accounting for translational invariance. Part 1: Static behavior

Original Research Article

Pages 1373-1382

Ahmed Frikha, Patrice Cartraud, Fabien Treyssède

Highlights

► Homogenization based on translational invariance is proposed for helical structures. ► We take advantage of translational invariance thanks to twisting coordinates. ► The microscopic problems are 2D and posed on the cross-section. ► The method is validated for axially loaded springs and seven-wire strands.

Mechanical modeling of helical structures accounting for translational invariance. Part 2 : Guided wave propagation under axial loads

Original Research Article

Pages 1383-1393

Fabien Treyssède, Ahmed Frikha, Patrice Cartraud

Highlights

► A semi-analytical FE formulation is proposed for axially loaded helical waveguides. ► We take advantage of translational invariance thanks to twisting coordinates. ► The 3D elastodynamic problem is reduced to a 2D model posed on the cross-section. ► The contact area increases with loads and modifies the veering frequency of strands. ► Numerical results are confirmed by experimental data for prestressed strands.

Conservation laws from any conformal transformations and the parameters for a sharp V-notch in plane elasticity

Original Research Article

Pages 1394-1401

Weichen Shi, Lin Lu

Highlights

► Two new independent Lagrangian functions are presented for plane elasticity. ► Conservation integral in Noether's sense includes any conformal transformation. ► A finite value can be obtained due to any conformal transformation. ► Two parameters for a sharp V-notch in Mode I and II problems are presented. ► Two parameters are equivalent to the NSIFs.

Anisotropy-induced broadband stress wave steering in periodic lattices

Original Research Article

Pages 1402-1414

F. Casadei, J.J. Rimoli

Hyperbolic heat conduction and associated transient thermal fracture for a piezoelectric material layer

Original Research Article

Pages 1415-1424

B.L. Wang, J.E. Li

Analysis of the effects of magnetic field on the induced stress in drilled plates

Original Research Article

Pages 1425-1436

G. Barbaraci, G. Marannano, G. Virzìmariotti

Highlights

► Experimental verification of the presence of induced stress in a drilled plate of steel by the magnetic field. ► Theoretical determination and magnetic and structural FEM analysis, with experimental determination of permeability curve. ► Determination, by FEM; of the better position of the coils to increase compressive stress around the hole. ► Simulation of the crack growth by FEM to verify the improvement of the strength plate when subjected to tensile static load.

Integral identities for a semi-infinite interfacial crack in anisotropic elastic bimaterials

Original Research Article

Pages 1437-1448

L. Morini, A. Piccolroaz, G. Mishuris, E. Radi

3D effects on crack front core regions, stress intensity factors and crack initiation angles

Original Research Article

Pages 1449-1459

Shafique M.A. Khan, Nesar Merah, Muhammad J. Adinoyi

Highlights

► The effect of the thickness is explicitly investigated using a mixed mode SENT specimen. ► The reduction in the plastic zone size decreases with decreasing value of the crack inclination angle. ► The

largest variation for SIF is observed at the surface. ► For uniaxial loading, the crack initiation angle at the surface is affected the most.

Static, free vibration and stability analysis of three-dimensional nano-beams by atomistic refined models accounting for surface free energy effect

Original Research Article

Pages 1460-1472

Gaetano Giunta, Yao Koutsawa, Salim Belouettar, Heng Hu

Homogenisation of slender periodic composite structures

Original Research Article

Pages 1473-1481

Julian Dizy, Rafael Palacios, Silvestre T. Pinho

Determination of dynamic intensity factors and time-domain BEM for interfacial cracks in anisotropic piezoelectric materials

Original Research Article

Pages 1482-1493

Jun Lei, Felipe Garcia-Sanchez, Chuanzeng Zhang

Constitutive equations in finite elasticity of swollen elastomers

Original Research Article

Pages 1494-1504

A.D. Drozdov, J.deC. Christiansen

Comment on "An extended strain energy density failure criterion by differentiating volumetric and distortional deformation" by Yujie Wei (Int. J. Solids Struct. 49 (9), 1117–1126)

Page 1505

N.P. Andrianopoulos

Response to discussion on "An extended strain energy density failure criterion by differentiating volumetric and distortional deformation"

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Yujie Wei