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# **Journal of the Mechanics and Physics of Solids**

**Volume 61, Issue 2, Pages 293-700 (February 2013)**

## **Interface-reaction controlled diffusion in binary solids with applications to lithiation of silicon in lithium-ion batteries**

Original Research Article

*Pages 293-310*

Zhiwei Cui, Feng Gao, Jianmin Qu

## **Finite size effects on crack front pinning at heterogeneous planar interfaces: Experimental, finite elements and perturbation approaches**

Original Research Article

*Pages 311-324*

S. Patinet, L. Alzate, E. Barthel, D. Dalmas, D. Vandembroucq, V. Lazarus

## **Surface energy, elasticity and the homogenization of rough surfaces**

Original Research Article

*Pages 325-340*

P. Mohammadi, L.P. Liu, P. Sharma, R.V. Kukta

## **A polycrystal plasticity model of strain localization in irradiated iron**

Original Research Article

*Pages 341-351*

Nathan R. Barton, Athanasios Arsenlis, Jaime Marian

## **A DEM model for soft and hard rocks: Role of grain interlocking on strength**

Original Research Article

*Pages 352-369*

Luc Scholtès, Frédéric-Victor Donzé

## **Grain boundary modeling using an elasto-plastic theory of dislocation and disclination fields**

Original Research Article

*Pages 370-384*

V. Taupin, L. Capolungo, C. Fressengeas, A. Das, M. Upadhyay

## **Surface effects on the piezoelectricity of ZnO nanowires**

Original Research Article

*Pages 385-397*

Shuangxing Dai, Harold S. Park

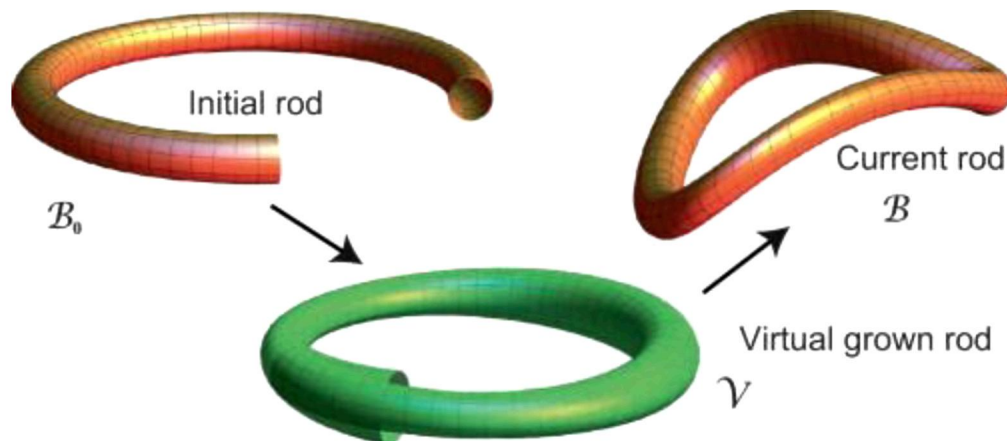
## Morphoelastic rods. Part I: A single growing elastic rod

Original Research Article

Pages 398-427

D.E. Moulton, T. Lessinnes, A. Goriely

### Graphical abstract



### Highlights

- ▶ A theory for growing elastic rods is developed based on the Kirchhoff equations.
- ▶ The generic formulation is based on the decomposition of deformation gradient in three-dimensional elasticity.
- ▶ A constitutive framework is built to model a growing rod on a rigid foundation.
- ▶ Buckling instabilities due to growth and external interactions are demonstrated.

## A two-scale methodology for determining the residual stresses in polycrystalline solids using high energy X-ray diffraction data

Original Research Article

Pages 428-449

Kevin P. McNelis, Paul R. Dawson, Matthew P. Miller

## Capillary buckling of a thin film adhering to a sphere

Original Research Article

Pages 450-471

J. Hure, B. Audoly

## Prediction of fracture toughness of ceramic composites as function of

## **microstructure: I. Numerical simulations**

Original Research Article

*Pages 472-488*

Yan Li, Min Zhou

## **Prediction of fracture toughness of ceramic composites as function of microstructure: II. analytical model**

Original Research Article

*Pages 489-503*

Yan Li, Min Zhou

## **Effect of the electric conductivity on the modeling of the poling process of ferroelectric components**

Original Research Article

*Pages 504-516*

Holger Schwaab, Marco Deluca, Peter Supancic, Marc Kamlah

## **Measurement of power-law creep parameters by instrumented indentation methods**

Original Research Article

*Pages 517-536*

Caijun Su, Erik G. Herbert, Sangjoon Sohn, James A. LaManna, Warren C. Oliver, George M. Pharr

### **Highlights**

► Uniaxial and indentation creep in amorphous selenium are examined experimentally. ► Several different methods for obtaining and analyzing creep data are examined. ► Bower's analysis correctly predicts the behavior under certain conditions. ► Full field finite element simulations are used to account for finite deformation. ► Influences of elasticity on the creep behavior are documented.

## **Formulation of a nonlinear porosity law for fully saturated porous media at finite strains**

Original Research Article

*Pages 537-556*

B. Nedjar

### **Highlights**

► A nonlinear porosity law for finite strain and high pore pressure is proposed. ► The law meets the physical restriction that the actual porosity must lie in  $[0,1]$ . ► Two alternative simplified variants are proposed and studied. ► The law is integrated in a sound thermodynamic framework of open media. ► Finite strain poroelasticity as well as poroplasticity are considered.

### **Symmetry-adapted phonon analysis of nanotubes**

Original Research Article

*Pages 557-578*

Amin Aghaei, Kaushik Dayal, Ryan S. Elliott

### **Stress relaxation through interdiffusion in amorphous lithium alloy electrodes**

Original Research Article

*Pages 579-596*

Y.F. Gao, M. Cho, M. Zhou

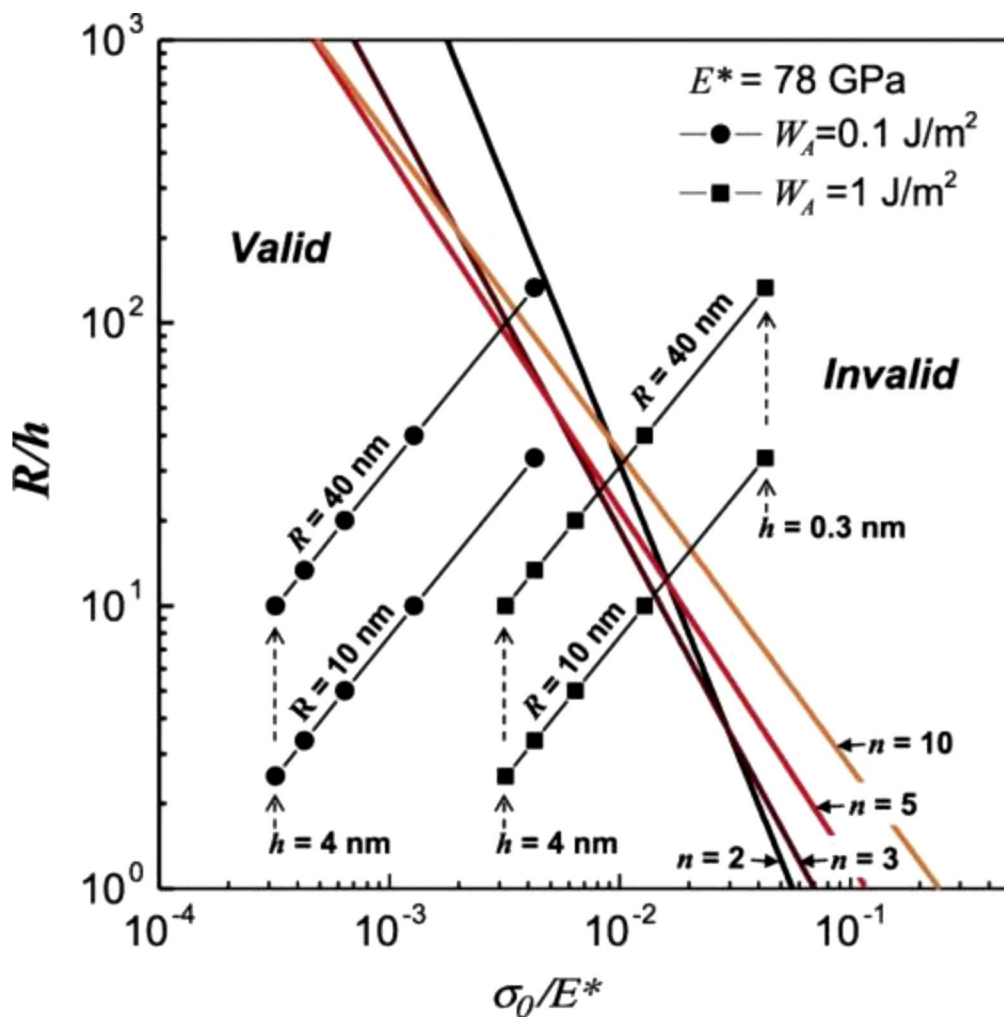
### **Adhesion of nanoscale asperities with power-law profiles**

Original Research Article

*Pages 597-610*

David S. Grierson, Jingjing Liu, Robert W. Carpick, Kevin T. Turner

### **Graphical abstract**



### Highlights

- Finite element analysis of adhesion between elastic, power-law shaped asperities.
- Validate a previously published M–D– $n$  model of adhesive contact.
- Measure the work of adhesion and the adhesion range for power-law-shaped AFM tips.
- Present a map that identifies a valid regime for simplified adhesion analysis.

### Giant voltage-induced deformation in dielectric elastomers near the verge of snap-through instability

Original Research Article

Pages 611-628

Tiefeng Li, Christoph Keplinger, Richard Baumgartner, Siegfried Bauer, Wei Yang, Zhigang Suo

### Allen–Cahn and Cahn–Hilliard-like equations for dissipative dynamics of saturated porous media

Original Research Article

*Pages 629-651*

Emilio N.M. Cirillo, Nicoletta Ianiro, Giulio Sciarra

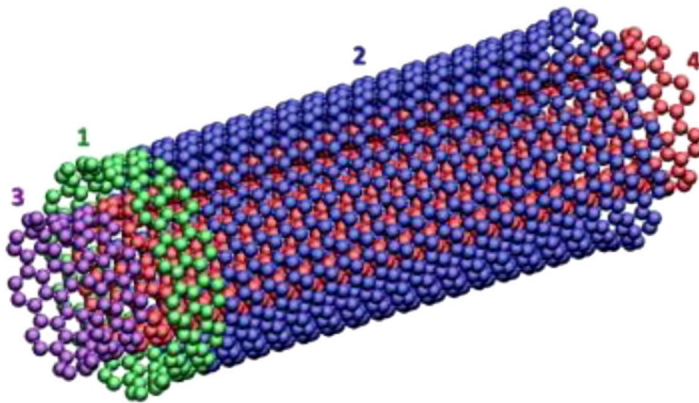
## **Mechanism of friction in rotating carbon nanotube bearings**

Original Research Article

*Pages 652-673*

Eugene H. Cook, Markus J. Buehler, Zoltan S. Spakovszky

### **Graphical Abstract**



## **Deformation and fracture of impulsively loaded sandwich panels**

Original Research Article

*Pages 674-699*

H.N.G. Wadley, T. Børvik, L. Olovsson, J.J. Wetzel, K.P. Dharmasena, O.S. Hopperstad, V.S. Deshpande, J.W. Hutchinson