UNIVERSITÀ DEGLI STUDI
DI TRENTO
Dipartimento di Ingegneria Civile,
Ambientale e Meccanica

INSTABILITIES

Instabilities and nonlocal multiscale modelling of materials
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AVVISO DI SEMINARIO

Si comunica che **venerdì 25 novembre 2016 a partire dalle ore 11.30**
si terrà presso l'aula **R2** (via Mesiano 77) il seguente seminario

Catastrophic thinning of soft dielectrics

Dr. Giuseppe Zurlo
National University of Ireland, Galway

In this seminar we present an energetic insight into the catastrophic nature of thinning instabilities in soft electroactive elastomers. These materials are invading our daily life, with applications ranging from stretchable electronics, to artificial muscles, micro-patterning, energy harvesters, bio-mimetic robots, and more. Thinning instabilities in voltage controlled soft dielectrics, generally described as "electro-creasing" or "pull-in" instabilities, are major obstacles to the development of technological applications; yet they are not completely understood nor modelled accurately.
In this work,we further an intuition of Blok and LeGrand [1], who first provided in1969 the experimental e vidence that dielectric breakdown is due to strong thinning localisation. In full agreement with experiments, we give a simple formula to predict the critical voltages for instability patterns; we model their shape and show that equilibrium is impossible beyond their onset. Our analysis is analytical, does not require linear bifurcation analysis or finite element simulations and can be extended to include pre-stretch and various material models. This is a joint work with Michel Destrade (NUI Galway - Ireland), Domenico DeTommasi & Giuseppe Puglisi (Politecnico di Bari - Italy).

[1] Blok J., LeGrand D. G., Dielectric Breakdown of Polymer Films. J. Appl.Phys., 40(1), 288-293 (1969).
[2] Arxiv preview of the article: https://arxiv.org/pdf/1610.03257.pdf

Tutti gli interessati sono invitati a partecipare.

Il seminario è organizzato dal gruppo di Scienza delle Costruzioni
(D. Bigoni, L. Deseri, N.Pugno, A. Piccolroaz, F. Dal Corso, M.F. Pantano, R. Springhetti, D. Misseroni)

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