



UNIVERSITÀ DEGLI STUDI
DI TRENTO

Dipartimento di Ingegneria Civile,
Ambientale e Meccanica



Instabilities and nonlocal
multiscale modelling of
materials
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AVVISO DI SEMINARIO

Si comunica che **martedì 10 luglio 2018 a partire dalle ore 10.45**
si terrà presso l'aula **R2** (via Mesiano 77) il seguente seminario

A model for the contraction of polymer gels created by the activity of molecular motors

Prof. Mattia Bacca

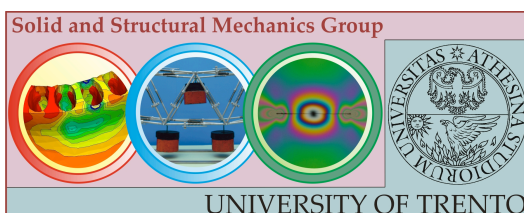
University of British Columbia, Canada

We propose a mathematical model based on non-equilibrium thermodynamics to describe the mechanical behavior of an active polymer gel created by the inclusion of molecular motors in its solvent. When activated, these motors attach to the chains of the polymer network and shorten them creating a global contraction of the gel, which mimics the active behavior of a cytoskeleton. The power generated by these motors is obtained by ATP hydrolysis reaction, which transduces chemical energy into mechanical work. The model is based on the Flory and Rehner theory for polymer network swelling and considers species diffusion to describe the transient passive behavior of the gel. The active behavior is modeled defining a volumetric density of mechanical power generated by the motors, through ATP hydrolysis, which increases the strain energy of the polymer network. The latter is depicted by an increment of the crosslink density in the polymer network, reducing the entropy of the polymer network. The model is finally adapted to the problem of uniaxial contraction of a slab of gel and compared with experimental results, showing good agreement.

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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