



UNIVERSITÀ DEGLI STUDI
DI TRENTO

Dipartimento di Ingegneria Civile,
Ambientale e Meccanica



Instabilities and nonlocal
multiscale modelling of
materials

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European Research Council
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AVVISO DI SEMINARIO

Si comunica che **lunedì 28 settembre 2015 a partire dalle ore 11.00**
si terrà presso l'aula R2 (via Mesiano 77) il seguente seminario

Computational methods for nonlinear fracture mechanics problems with large displacements

Prof. Marco Paggi

IMT Institute for Advanced Studies Lucca

Decohesion and fracture phenomena undergoing large displacements take place in a wide range of applications ranging from peeling of a tape to crazing of polymer interfaces. During this seminar, a consistent derivation of a new interface element for large displacements is presented. The resulting operational formulation for 2D and 3D enables any order of kinematic interpolation and constitutive behavior of the interface. The interplay between geometrical and material nonlinearities is investigated in reference to peeling tests, considering different cohesive zone models for the interface and small or large deformation theory for the continuum. Applications to fracture of fibrillar interfaces with arbitrary in-plane and out-of-plane distributions of fibers are also discussed. Finally, it is shown that the use of the proposed interface element formulation along with solid shells opens new perspectives in the simulation of the complex interplay between buckling and delamination in bimaterial systems, such as thermal barrier coatings.

Acknowledgements

The research leading to these results has received funding from the European Research Council under the European Union's Seventh Framework Programme (FP/2007–2013)/ ERC Grant Agreement n. 306622 (ERC Starting Grant "Multi-field and multi-scale Computational Approach to Design and Durability of PhotoVoltaic Modules" – CA2PVM).

Selected references

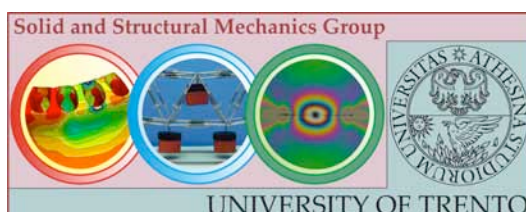
J. Reinoso, M. Paggi (2014) A consistent interface element formulation for geometrical and material nonlinearities, *Computational Mechanics*, 54:1569-1581.

M. Paggi, J. Reinoso (2015) An anisotropic large displacement cohesive zone model for fibrillar and crazing interfaces, *International Journal of Solids and Structures*, 69-70:106-120.

J. Reinoso, M. Paggi, R. Rolfes (2015) A computational framework for the interplay between delamination and wrinkling in functionally graded thermal barrier coatings, *Computational Materials Science*, in press.

Tutti gli interessati sono invitati a partecipare.

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



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