



UNIVERSITÀ DI PISA

**DIPARTIMENTO DI INGEGNERIA CIVILE E INDUSTRIALE (DICI)**

Sede di Ingegneria Strutturale

Largo Lucio Lazzarino (già Via Diotisalvi, 2)

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## *S E M I N A R I di INGEGNERIA STRUTTURALE*

### *AVVISO*

Il Dott. Ing. **Marco Gigliotti**,  
Maître de Conférences presso l'Università di Poitiers e l'Ecole  
Nationale Supérieure de Mécanique et Aérotechnique di Poitiers,

terrà un seminario dal titolo

### **On the Measurement of Residual Strains and Stresses in Composite Laminates.**

Il seminario sarà tenuto  
**giovedì 30 gennaio 2014 alle ore 15:30** in Aula Pacinotti.

**Abstract.** Residual strains and stresses may arise in composite materials due to temperature changes, absorption of moisture, diffusion-reaction of species in structural parts exposed to aggressive environments, for instance turbo-engines employed in the aeronautical industry. Such stresses may be apparent at the microscopic scale, due to the heterogeneity of the elementary constituents (fibres, matrix, interface...), or at the mesoscopic scale (the scale of a ply), due to the mismatch between the physical or mechanical properties of adjacent plies.

This talk discusses the employment of 0/90 unsymmetric composite plates for the measurement and the monitoring of residual stresses at the ply scale. It is shown that the employment of such model samples is characterised by a quite peculiar behaviour, related to bifurcation of the solution and multistability: all these features may be conveniently exploited for measurement purposes.

Some examples concerning the characterisation of residual curing stress, of transient and cyclical hygrothermal stress related to the exposition to a fluctuating humid environment and to the chemical stress associated to thermo-oxidation phenomena in composites exposed to high temperatures are presented and discussed.

Referenti dell'invito: Stefano Bennati e Paolo S. Valvo.

Pisa, 21 gennaio 2014.