

I Riunione  
**Gruppo Materiali**  
**dell'Associazione Italiana Meccanica Teorica ed Applicata (AIMETA)**  
**GMA07**  
Trento, 23 e 24 febbraio 2007

---

**REFINED BEAM MODELS FOR INTERLAMINAR FRACTURE TOUGHNESS TESTS  
OF FIBRE-REINFORCED LAMINATES**

S. Bennati & P.S. Valvo

*Dipartimento di Ingegneria Strutturale, Università di Pisa, Via Diotisalvi 2 – 56126 Pisa, Italia.  
Email s.bennati@ing.unipi.it ; p.valvo@ing.unipi.it*

Interlaminar fracture toughness of fibre-reinforced laminates is assessed via laboratory tests carried out on beam-shaped specimens with pre-implanted delaminations. Simple models of these tests are based on classical beam theory. Refined models consider elastic interfaces between the separating layers and allow for shear deformability. In this case, through lengthy calculations, we find complete explicit solutions, and obtain concise expressions for the compliance and energy release rate, achieving a surprising agreement with the results of experiments and more complex models.