

## **Advances in the Meso-modeling of Laminates for the Prediction of Energy Absorption**

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### **ABSTRACT**

The intensive use of long-fibers composite laminates in aeronautics or automotive applications implies to master the prediction of the behavior up to final failure. Following the works of (Ladevèze et al) this presentation will rely on two types of models:

- an hybrid model for material virtual testing of small coupons, where all possible cracks are introduced;
- an homogenized damage meso-model for the virtual testing of larger specimens.

Motivated by the virtual testing of energy absorbers the presentation will discussed, within those model frameworks, the introduction of two particular aspects: the kinking phenomenon and the rate dependent modeling of delamination. The question of the objective simulation of erosion and failure of composite in dynamics by damage mechanics will also be discussed.