

## Numerical Crashworthiness Investigations of a Full-Scale Composite Fuselage Section

**Authors :** Redouane Lombarkia

**Abstract :** To apply a new material model developed and validated for plain weave fabric CFRP composites usually used in stanchions in sub-cargo section in aircrafts. This work deals with the development of a numerical model of the fuselage section of commercial aircraft based on the pure explicit finite element method FEM within Abaqus/Explicit commercial code. The aim of this work is the evaluation of the energy absorption capabilities of a full-scale composite fuselage section, including sub-cargo stanchions. Drop tests were carried out from a free fall height of about 5 m and impact velocity of about 6 m/s. To assess, the prediction efficiency of the proposed numerical modeling procedure, a comparison with literature existed experimental results was performed. We demonstrate the efficiency of the proposed methodology to well capture crash damage mechanisms compared to experimental results

**Keywords :** crashworthiness, fuselage section, finite elements method (FEM), stanchions, specific energy absorption SEA

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