

Title: Design and optimisation of advanced CFRP composite sub-structures to improve failure resistance

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Summary:

Polymer composites offer great possibilities for more efficient structural design in terms of stiffness, strength, toughness and weight. The main goal of this inter-disciplinary project in composite materials, design optimisation and aerospace engineering is to investigate the influence of 3D reinforcement on the delamination failure, progressive failure mechanisms and energy absorption capabilities of carbon fibre composite absorbers under various loading conditions, using state-of-the-art techniques. In this regard, an analytical model based on an energy balance approach and multi-objective optimisation problem will be proposed to estimate the optimum design of CFRP composite absorber. The explicit finite element techniques will be also used to predict the failure behaviour of CFRP composite sub-structures.