

Composites at the Limit: Embracing Buckling for Innovation in Aerospace Structures

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ABSTRACT

All structural designers know that their structures must meet two basic criteria: the strength criterion and the stiffness criterion. In aerospace, an additional criterion has always been considered for thin-walled components subjected to compression or shear stresses: the stability criterion.

The presentation will demonstrate that a paradigm shift in design concepts of composite aerospace structures can be introduced, considering buckling not as a phenomenon to avoid, but as a favorable behavior to actively exploit. This will be explained alongside new challenges related to the design and analysis of composite aerospace structures, validated by experiments using advanced test techniques.

In particular, the results of a recent European project related to the design of an aircraft thermoplastic composite stiffened panel will be presented along with the design methodology that is the primary focus of the ongoing ERC Advanced Grant NABUCCO.

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