

## **On the use of Digital Image Correlation to assess the damage behaviour of composite coupons under compression**

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### **Abstract.**

A strong increase in the use of composite materials have been observed in all the industrial fields, related to manufacturing of lightweight load-bearing components. However, despite the excellent mechanical properties which characterize such innovative materials, uncertainties still exist on their complex failure mechanisms. Hence, the use of non-destructive techniques and experimental tests is needed to increase the understanding of composite materials damage evolution. This paper deals with the use of the Digital Image Correlation (DIC) technique to investigate the failure mechanisms of delaminated composite panels under compressive loading conditions, accounting for the complex phenomena related to unstable delamination growth due to buckling snap-through. The panels have been produced by tuning manufacturing parameters to test their influence on toughening mechanisms such as fibre bridging. The main aim is to understand how to improve laminates out-of-plane performances and delay the delamination growth phenomenon. The obtained data in terms of strain and displacements distributions have been used to assess the phenomenon of delamination propagation related to local delamination and global panels' instabilities.