

## **Smart Behaviour of CNT Modified Adhesive Films for Carbon Fiber Composite Repair**

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### **ABSTRACT**

There is an increasing interest in various repair technologies for primary structural components of aircraft. When a composite structure sustains damage in service, if the damage has weakened the structure through fibre, fracture or delamination, a structural repair must be applied. This kind of repair, unlike cosmetic or temporary ones, involves replacement of the damaged fibre reinforcement to restore the original mechanical properties. The use of adhesively bonded composite repair patches is one of the possible solutions. For ensuring the quality of these repairs, it is necessary to develop non-destructive testing techniques, such ultrasonic c-scan, vibrothermography and shearography; with the capability to characterize the presence of damage in carbon fibre composites structures with patch repairs.

An alternative to NDT is to provide smart behaviour to the adhesive joint. Present contribution analyses the sensing capability of adhesive joints made with a carbon nanotube doped adhesive film. This film shows the capability to detect deformation and failure by means the measurement of changes in its electric conductivity. Obtained results showed that structural film adhesives could be surface doped with CNT providing sensing capabilities of repairs in composites.