Séminaire exceptionnel PIMM

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Numerical design and virtual testing of bonded composite joints and repairs

Abstract
While for secondary aircraft structures, adhesive bonding is a common practice for joints and repairs, the certification rules that are applicable for primary structures prevent the use of bolt-free bonded joints, as a result of earlier experiences, where the interpretation of the rules led to in-service premature failure incidents on adhesively bonded joints. In the process to comply with the certification guidelines, Virtual Testing is a very powerful tool which can lead to a significant reduction of cost and time. In the present lecture, the Means of Comply for the certification of adhesive bonding for primary aircraft structures will be briefly described and the use of Virtual Testing in the design of bonded joints and repairs will be discussed through the presentation of a series of applications starting from bonded coupons and reaching up to bonded structural parts. The presented applications include quasi-static, fatigue and impact load-cases.