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An experimental analysis of fracture mechanisms by acousticemission of woven composite bolted assembly

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Abstract: This work is focused on the study of the evolution of damage mode and failure mechanisms of woven composite bolted assembly carbon fiber/epoxy. In the present paper three configurations are studied [0°,45°,0°,45°], [0°,45°,0°,45°]s and [0°,45°,0°,45,0°]s. In order to analyze a global mechanical behavior of the assembly, monotonous tensile tests are performed. The damage evolution is followed simultaneously by acoustic emission (A.E) and digital image correlation (D.I.C). Acoustic signatures of four modes of damage are identified, matrix cracking, fiber-matrix debonding, delaminating and fiber breakage, then confirmed by microscopic observations in scanning electron microscopy (SEM).Composite woven, émission acoustique, assemblage boulonné, corrélation d'image numérique, endommagement.

Keywords : Woven composite, acoustic emission, bolted assembly, digital image correlation, Damage.