

New approach for the damage mechanisms identification in the glass-epoxy composites

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Abstract : The aim of this work is to introduce a new approach for clustering acoustic emission data occurring during the fracture process of glass fibre reinforced polymer (GFRP) plates. In particular, we have developed signal processing techniques based on continuous wavelet transform (CWT) in order to isolate acoustic signature corresponding to each damage mechanism (fibre breakage, matrix cracking, etc.). Entropy criterion was used to provide selection of most significant wavelet coefficients of AE signals. Models are established in the form of dictionaries, whose elements are the waveforms collected during specific experiments in which the created damage mechanisms are well known. Dictionaries should be used to classify acoustic emission signals recorded when polymer composites are under load.

Keywords : acoustic emission, wavelet transform, damage mechanisms