عنوان مقاله:

INTEGRATION OF FUZZY CLUSTERING MEANS AND PRINCIPAL COMPONENT ANALYSIS TO CLASSIFY DAMAGES BY EVENTS EXTRACTED FROM CONSTRAINED GLASS/POLYESTER COMPOSITES

محل انتشار:

کنفرانس ملی مهندسی مکانیک ایران (سال: 1392)

تعداد صفحات اصل مقاله: 17

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خلاصه مقاله:

Acoustic emissions (AE) can be used to disassociate the dissimilar types of damage occurring in composite materials. However, the main problem associated with data analysis is the classification of different AE sources. Thus this article focuses on the use of pattern classification to classify different fracture signals from background noises. The target of the cluster analysis is to classify a set of data into several classes that reflect the internal structure of the data. Indeed, clustering method is a vital tool for investigating and interpreting data. In this work, a procedure for the evaluation of delamination mechanism in glass/polyester composite specimen with different configuration based on the analysis of the AE signals of presented. Fuzzy clustering means (FCM) integrated with principal component analysis (PCA) are the tools that utilized for the classification of the monitored AE transients. It is shown that the integrated of PCA and FCM is an effective tool for identifying damage modes such as matrix cracking, fibre–matrix debonding and fibre breakage in the glass/polyester composites. The presence of damage modes in glass/polyester composites was proven with scanning electron microscopy images (SEM).

کلمات کلیدی:

Damage mode; Glass/polyester composite; Acoustic emission; Unsupervised pattern recognition