

未定

基于高阶谱的混凝土材料断裂声发射特征提取

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摘要

研究混凝土受载时的声发射信号特征是当前无损检测的研究热点。针对混凝土受载时声发射信号的非高斯特性,提出了一种基于高阶谱技术的声发射信号特征提取的新方法。通过对声发射信号的双谱分析,提取了不同载荷阶段下信号的非高斯特征。以信号双谱幅值的平均值作为特征值,对不同载荷下信号偏离高斯分布的程度进行了定量地分析,并讨论了不同载荷强度的混凝土声发射信号的双谱特性及非高斯特征。实验结果表明,提取的特征值反映了信号偏离高斯分布的程度,据此可以作为混凝土受载时断裂临界点的判据。通过与声发射事件等常规参数的比较,可以发现高阶谱参数具有更好的敏感性。

关键词 [混凝土材料](#) [声发射](#) [断裂](#) [高阶谱](#)

分类号

Feature Extraction of Concrete Material's AE Measuring Based on

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Abstract Studying the characteristic of the AE (Acoustic emission) signal of the concrete under load is one of hottest research fields of nondestructive testing currently. A new method based on higher-order spectrum was proposed to analyze the differential AE signal in this study on the non-Gaussian characteristics of the differential load of concrete. The non-Gaussian characteristics of differential AE signal of different load were extracted by using bispectral method. The average bispectral magnitude of differential AE signal was taken as an eigenvalue for the quantitative analysis of the deviation degree from normality. Meanwhile, the signal bispectral features and non-Gaussian characteristics of different load were discussed. The experimental results show that the extracted eigenvalue reflects the deviation degree from normality and that the transition of load can be determined from the extracted eigenvalue. However, the High-order spectrum and correlation of the AE have been presented more sensitive than normal parameters, such as AE events and RMS.

Key words [concrete material](#) [acoustic emission](#) [Fracture](#) [High-order spectrum](#)

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