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# Corrosion Damage Mechanism Identification for Bridge Cable using Pattern Recognition of Acoustic Emission Feature

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**ABSTRACT**
Acoustic emission (AE) is an effective nondestructive method in recognizing the different types of damage occurring in structural corrosion. In this study AE technique was used for monitoring the bridge cables corrosion damage evolution. For during corrosion test various damage mechanisms appear, their classification is of major importance. Integration of k-means algorithm and fuzzy c-means methods was applied as an efficient clustering method to discriminate different bridge cable corrosion damage mechanism. Corrosion damage properties of bridge cables were analyzed through AE signals. AE characteristic parameters were obtained through accelerated corrosion test. Through clustering analysis, AE data can be classified into different types that related to different damage modes, the AE signals of obtained clusters were assigned to distinct damage mechanisms. Also, the dominance of damage mechanisms was determined based on the distribution of AE signals in different clusters.

**KEYWORDS:** *acoustic emission, bridge cable, clustering analysis, damage pattern recognition*