

Subcritical Crack Monitoring in Rocks Using Combined Electromagnetic and Acoustic Emission Analysis

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Abstract:

This paper explores the use of sensor fusion techniques, combining acoustic emission (AE) and electric field (EME) sensing, for the detection of cracking in rocks and man-made materials. The research focuses on subcritical cracking processes, which are often difficult to detect with traditional methods. While neither AE nor EME signals alone provide reliable detection due to noise and interference, their combination enhances sensitivity and spatial resolution. This approach demonstrates the potential to develop reliable methods for use not only in the laboratory, but also in outdoor, natural conditions, using basic signal processing techniques and machine learning.

Keywords: Sensor fusion, Acoustic emission sensors, Electric field instrumentation, Rock fracturing, Subcritical cracking, Signal processing

Category (topic): VIII Measuring Techniques

Preference: Oral, but Poster is acceptable

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