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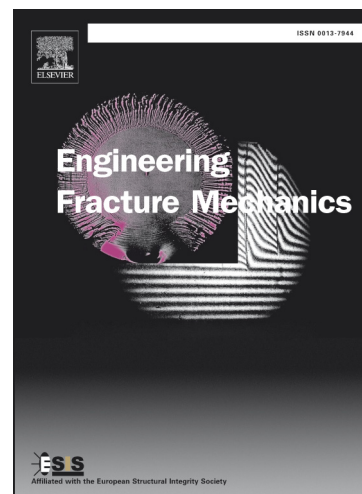
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Opening and Mixed Mode Fracture Processes in a Quasi-Brittle Material via Digital Imaging

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Abstract

Fracture tests were performed on sandstone specimens under three-point bending with a variety of notch positions to achieve $K_{II}/K_I = 0 - 12\%$. At peak load, the maximum crack opening displacement measured by digital image correlation was $45 \mu\text{m}$ under mixed mode loading and $30 \mu\text{m}$ under mode I, and these values were used to determine the length of the cohesive zone: $10 - 12 \text{ mm}$ for mixed mode and $5 - 7 \text{ mm}$ for mode I. For mixed mode fracture, the displacement in the cohesive zone was identified to be opening only, while sliding and opening were detected along the remaining length.

Keywords: Mixed mode fracture, cohesive zone, digital image correlation (DIC), quasi-brittle material, fracture initiation and propagation.

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