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Amine Jamaaoui, Octavian Pop, Frédéric Dubois, Guy Costa

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**Wedge Splitting Test on Douglas genotypes using an integrated mixed-mode approach**

Amine JAMAAOUI<sup>1</sup>, Octavian POP<sup>1</sup>, Frédéric DUBOIS<sup>1</sup>, Guy COSTA<sup>2</sup>

<sup>1</sup>Univ. Limoges, GEMH, EA 3178, F-19300 Egletons, France

<sup>2</sup>Univ. Limoges, LCSN, UPRES EA 1069, F-87000 Limoges, France

**Abstract:**

The objective of this study is to estimate the influence of mixed mode on the global fracture energy. The experimental tests were carried out using three Douglas genotypes. In order to evaluate the fracture parameters the Wedge Splitting Tests were performed. The fracture parameters were estimated from the optical measurements coupled with numerical and analytical approaches. Firstly, the fracture energy was estimated from the work of fracture calculated from the splitting force – Crack Opening Displacement curve. In this case, the Crack Opening Displacement was measured by means of Mark Tracking method. Secondly, the fracture parameters and, consequently the fracture energy was evaluated using an integrated mixed mode approach. In this second case, the experimental measurements were performed by Digital Image Correlation. The fracture energy corresponding to opening and shear modes was calculated by using an adjustment procedure coupled with Stress Intensity Factor calculation and the phase angle. This second approach allowing the calculation of fracture energy without the influence of experimental noises. The results show that the proposed integrated mixed mode approach allows evaluate the part of each mode in the fracture process.

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