SM9L_10864

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

Experimental and Numerical Crack Growth in a Special Geometry

Liviu Marsavina[(1)], Dan M. Constantinescu[(2)]

(1) *Department of Strength of Materials, University "Politehnica" of Timisoara, Timisoara, Romania*
(2) *Department of Strength of Materials, University "Politehnica" of Bucharest, Bucharest, Romania*

From experimental tests on a motor grain model it appears that both SIF values and crack geometry during growth are quite variable due to shear modes for the off-axis inclined cracks. The numerical study was to find the SIFs versus crack length for three different configurations: symmetric crack, off axis straight-in crack and off-axis inclined crack. The experimental off-axis straight-in crack remains straight in growth after some minor rearrangements, and Mode I is present. For the off-axis inclined crack, which turns on a curved path, after some limited amount of growth Mode II as well as Mode I remained. The numerical simulation shows a rapid change of direction and presence of Mode I. At maximum depth all the experimental 3-D SIFs were smaller than the numerical 2-D corresponding values. For complete three-dimensional numerical simulations mode III has to be considered.

View the extended summary