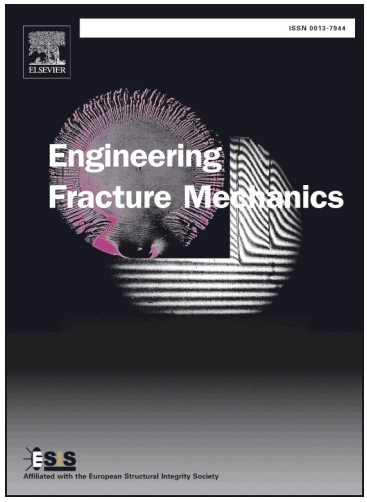

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Further Investigation of Stress Intensity Factor Solutions for Similar and Dissimilar Welds in Lap-Shear Specimens under Clamped Loading Conditions

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Abstract

In this paper, finite element analyses are employed to obtain the stress intensity factor solutions for similar and dissimilar welds in lap-shear specimens under pinned and clamped loading conditions. Analytical solutions for welds in lap-shear specimens under clamped loading conditions are then derived based on the energy release rate and the structural stress approaches. Both computational and analytical solutions indicate that the clamped loading reduces the stress intensity factor solutions for a given specimen geometry by about 7% for similar welds and by about 20% for dissimilar aluminum/steel and magnesium/steel welds, and results in higher fatigue lives of the welds.

Keywords: similar weld; dissimilar weld; lap-shear specimen; stress intensity factor; clamped loading

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