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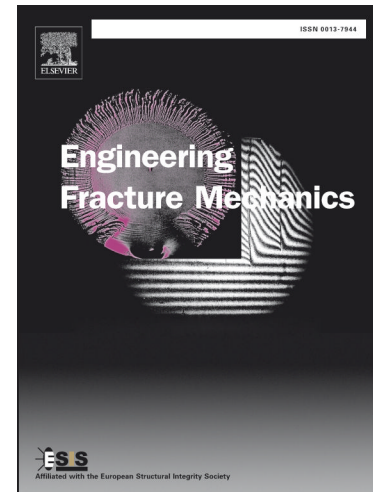
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J-integral expression for mixed mode I/II ductile failure prediction of U-notched Al 6061-T6 plates under large-scale yielding regime

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Abstract

The main purpose of the present research is to check if the Equivalent Material Concept (EMC) is capable of being combined with the J-integral failure criterion to form a new ductile failure model, called EMC-J criterion, to predict the load-carrying capacity (LCC) of U-notched aluminum plates under mixed mode I/II loading. To achieve this purpose, first, a set of experimental results on LCC of some tested U-notched Al 6061-T6 rectangular specimens, failed by large-scale yielding (LSY) regime, are taken from the recent literature. Due to the elastic-plastic behavior of the tested Al 6061-T6, EMC is utilized to avoid complex and time-consuming non-linear failure analyses for LCC predictions. Then, a new combined ductile failure model is proposed in which J-integral criterion, as a well-established brittle fracture criterion, is combined with EMC to predict theoretically the experimental results of the

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