

# VARIABLE AMPLITUDE FATIGUE CRACK GROWTH MODELLING

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## ABSTRACT

*Fatigue crack growth in structural components is often subjected to variable amplitude loading. This paper describes the more relevant crack growth transients generally observed under simple variable amplitude loading sequences and several crack propagation models that consider the load interaction effect in fatigue crack growth. Many models have been proposed to predict fatigue crack propagation that consider the loading history. The basic models are analysed and discussed. The Wheeler model is one of the simplest and most widely employed models to quantify the fatigue crack growth retardation after a single overload. This model is able to describe the basic phenomena of retardation due to overloads. However, due to its simple formulation is unable of accounting the other observed post-overload crack growth transients, the effect of underloads, and more difficulties arise when both overloads and underloads are involved. Therefore, more recent models that propose a number of modifications to the Wheeler model, to improve its accuracy in predicting fatigue crack growth under variable amplitude loading, are also analysed.*