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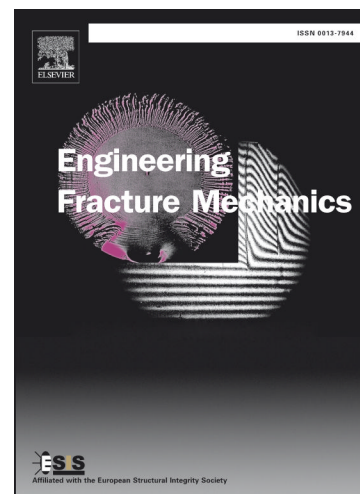
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Experimental investigation and numerical prediction on creep  
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superalloy

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## Abstract

Creep crack growth behaviors of the Inconel 625 superalloy at 650 °C are investigated through experimental and numerical methods. The simulated data agree well with the experimental results, reflecting that the multi-axial creep performance parameter  $\alpha$  obtained by present paper can reasonably predict the creep crack growth behaviors of Inconel 625 superalloy. The crack initiation time takes up the most proportion of the whole life for all the load levels, and intergranular fracture is the dominated failure mechanism. Creep constraint effect is not obvious for the  $C^*$  to characterize the creep crack growth of Inconel625 superalloy.

**Keywords:** Inconel 625 superalloy; creep crack growth; intergranular fracture; multi-axial stress state; Creep constraint effect;

## 1. Introduction

Inconel 625, as a kind of solid-solution-strengthened nickel-based superalloy, is extensively used in chemical, petrochemical, aerospace, aeronautical and nuclear

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