

Accepted Manuscript

Threshold Stress Intensity Factor Range of a Mechanically-long and Microstructurally-short Crack Perpendicular to an Interface with Plastic Mismatch

Bochuan Li, Motomichi Koyama, Shigeru Hamada, Hiroshi Noguchi

PII: S0013-7944(17)30576-3
DOI: <http://dx.doi.org/10.1016/j.engfracmech.2017.07.023>
Reference: EFM 5625

To appear in: *Engineering Fracture Mechanics*

Received Date: 28 May 2017
Revised Date: 16 July 2017
Accepted Date: 17 July 2017

Please cite this article as: Li, B., Koyama, M., Hamada, S., Noguchi, H., Threshold Stress Intensity Factor Range of a Mechanically-long and Microstructurally-short Crack Perpendicular to an Interface with Plastic Mismatch, *Engineering Fracture Mechanics* (2017), doi: <http://dx.doi.org/10.1016/j.engfracmech.2017.07.023>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Journal: *Engineering Fracture Mechanics*

Threshold Stress Intensity Factor Range of a Mechanically-long and Microstructurally-short Crack Perpendicular to an Interface with Plastic Mismatch

Bochuan Li^a, Motomichi Koyama^a, Shigeru Hamada^a, and Hiroshi Noguchi^{a*}

^aFaculty of Engineering, Kyushu University, 744 Moto-oka, Nishi-ku, Fukuoka-shi, Fukuoka 819-0395, Japan

Corresponding author: nogu@mech.kyushu-u.ac.jp

Abstract

In this study, we investigated long fatigue crack growth perpendicular to a soft-hard material interface comprising the same Young's moduli but different yield strengths. We determined the degree of fatigue crack growth retardation attributable to the interface under the constant stress intensity factor range (ΔK) using the plasticity-induced crack closure analysis with the Dugdale model. We subsequently determined the threshold stress intensity factor range (ΔK_{th}) under a constant stress amplitude (σ_a). Under a constant ΔK , the retardation degree was primary dependent on the two materials' yield strength ratio. Under a constant σ_a , ΔK_{th} was dependent on both the yield strength ratio and the distance between initial crack tip and interface.

Keywords: Threshold stress intensity factor range, bi-material interface, plasticity-induced crack closure, Dugdale model

Download English Version:

<https://daneshyari.com/en/article/5013809>

Download Persian Version:

<https://daneshyari.com/article/5013809>

[Daneshyari.com](https://daneshyari.com)