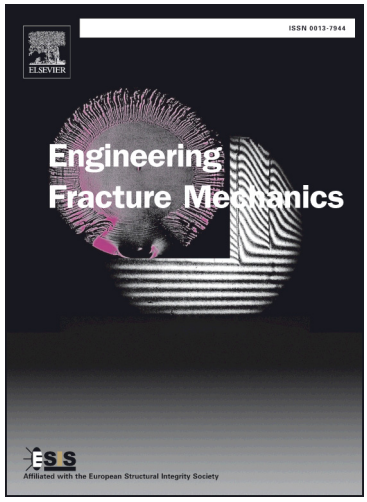

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PII: S0013-7944(16)30264-8
DOI: http://dx.doi.org/10.1016/j.engfracmech.2016.03.050
Reference: EFM 5223

To appear in: *Engineering Fracture Mechanics*

Received Date: 6 March 2016
Accepted Date: 23 March 2016

Please cite this article as: Ruggieri, C., Savioli, R.G., Dodds, R.H. Jr., Comments on W.S. Lei's discussion of "An engineering methodology for constraint corrections of elastic-plastic fracture toughness - Part II: Effects of specimen geometry and plastic strain on cleavage fracture predictions" by C. Ruggieri, R. G. Savioli and R. H. Dodds, *Engineering Fracture Mechanics* (2016), doi: http://dx.doi.org/10.1016/j.engfracmech.2016.03.050

Comments on W.S. Lei's discussion of "An engineering methodology for constraint corrections of elastic-plastic fracture toughness - Part II: Effects of specimen geometry and plastic strain on cleavage fracture predictions" by C. Ruggieri, R. G. Savioli and R. H. Dodds

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June 13, 2016

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Abstract

In recent communication to this journal, Lei [1] raised several questions on previous work by Ruggieri et al. [2] which extended a modified Weibull stress ($\tilde{\sigma}_w$) model incorporating the influence of plastic strain on cleavage fracture to correct effects of constraint loss in fracture specimens with a diverse range of specimen geometry. This brief note provides further arguments in support of the modified Weibull stress methodology. This short presentation also shows that Lei's conclusions are not necessarily substantial as they follow from incorrect interpretation of the Weibull stress framework.

Keywords: Cleavage Fracture, Local Approach, Weibull Stress, Plastic Strain, Probabilistic Fracture Mechanics

1 Introduction

In recent communication to this journal, Lei [1] raised several questions on our previous work [2] which extended a modified Weibull stress ($\tilde{\sigma}_w$) model incorporating the influence of plastic strain on cleavage fracture to correct effects of constraint loss in fracture specimens with a diverse range of specimen geometry. Using experimentally measured J_c-values derived from fracture toughness testing conducted on an A515 Gr 65 pressure vessel steel in the ductile-to-brittle transition (DBT) temperature, we demonstrated convincingly that the modified Weibull stress methodology effectively removes the geometry dependence on J_c-values and yields estimates for the reference temperature, T_0, from small fracture specimens in good agreement with the corresponding estimates derived from testing of larger crack configurations. We welcome any contribution and discussion on our extension of the Beremin model [3, 2]. Nevertheless, Lei's discussion should not be uncritically endorsed. In this brief note, we address the key points of interest raised in Lei's discussion in the approximate order they appear.

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