

Abstract Submitted
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Interacting Cracks in an Environmentally Assisted Fracture

ARTEM LEVANDOVSKY, ANNA BALAZS, University of Pittsburgh — We perform the study of environmentally assisted fracture within the framework of a lattice model. Formation of an ensemble of environmentally assisted microcracks, their coalescence and formation of crack “avalanches” lead to a very rich dynamical picture. Under specific condition crack healing can occur due to cohesive forces, which hold material together and tend to pull atoms together even if they are separated by a crack over several lattice units. We investigate the dynamical interplay between crack formation, arrest, healing and re-cracking. The goal here is to provide an understanding of the conditions leading to the phenomena of crack healing that happens along with the crack formation. We study the morphology of crack patterns with the intentions to establish a way to enhance the healing property of a material sample.

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