Abstract:

Micro Tensile Testing

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This presentation summarizes experimental developments used to measure grain level strain via digital image correlation (DIC) techniques on different steels, aluminum alloys, and other metallic materials. Tensile testing performed in-situ during optical and scanning electron microscopy allowed examination of the material's deformation and fracture behavior. The results reveal that the heterogeneous nature of deformation leading to fracture is dominated by twin and grain boundary related failures. Emphasis was placed on the design and development of miniature tensile devices and on the preparation of mini tensile specimens for in-situ microscopic observation.