

QUASICONTINUUM ANALYSIS OF INTERACTION BETWEEN SCREW
DISLOCATION AND COHERENT TWIN BOUNDARY
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Abstract. The interaction between pure screw dislocation with dislocation line directions lying parallel to the twin plane and Coherent Twin Boundary $\Sigma 3$ of copper has been studied using Quasi-Continuum method. The coherent twin boundary provides high barrier to slip transmission. The dislocation pile-up modifies the stress field at its intersection with the grain boundary. We introduce a methodology to calculate the stress barriers during slip-GB interaction. Screw dislocation approaching the boundary from one side may either propagate into the adjacent twin grain by cutting through the twin boundary. Quantitative estimation of critical stress for transmission phenomena is performed by using virial stress. The mechanism and critical stress obtained were in line with the literature [1-4]. Such information can be used as input for Discrete Dislocation Dynamics models (see Figure 1).

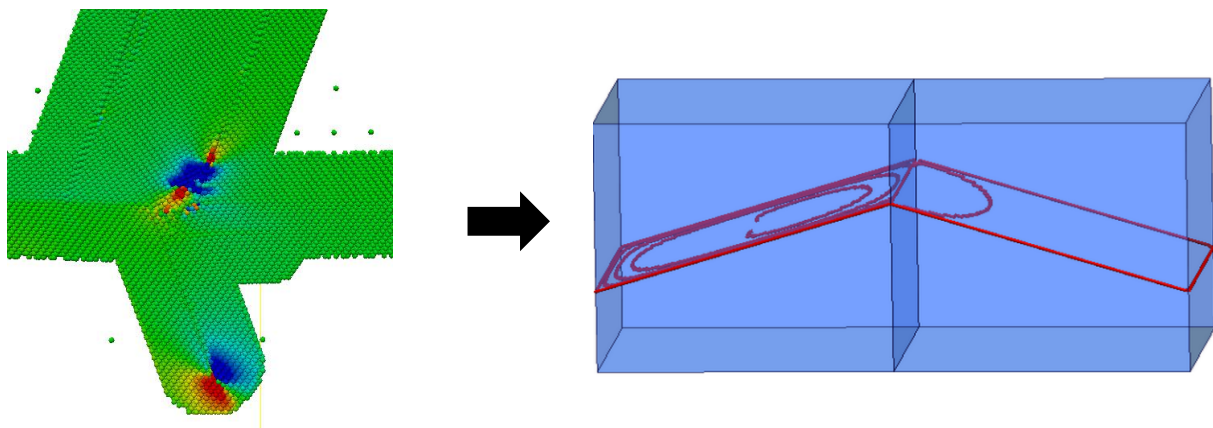


Figure 1 : Interaction between screw dislocation and Twin Boundary (a) virial stress field by Quasi Continuum method, (b) DDD simulation

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