Abstract Submitted
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Grain coarsening in crystals from evolution of dislocation densities : Results from a continuum theory of dislocation dynamics WOOSONG CHOI, YONG CHEN, STEFANOS PAPANIKOLAOU, JAMES SETHNA, Cornell University, SURACHATE LIMKUMNERD, Chulalongkorn University — Continuum theories of grain growth and coalescence dynamics currently use phase-field and other models without direct connection to the underlying dislocations which form the polycrystal grain boundaries. We extend a recently proposed wall-forming continuum dislocation dynamics theory[1] to incorporate dislocation line tension energy, and explore the resulting coarsening dynamics in two dimensions. We report initial results both on scaling behavior, coarsening and coalescence mechanisms emerging from our theory, and compare to experimental results.

[1]S. Limkumnerd and J. P. Sethna, Phys. Rev. Letters **96**, 095503 (2006)

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