Sciarrà, G.; Vidoli, S.
The role of edge forces in conservation laws and energy release rates of strain-gradient solids. (English) Zbl 1291.74038

Summary: Conservation laws and energy release rates for general strain-gradient elastic solids are derived in a finite deformation framework. With respect to the relevant literature new terms are derived modelling the energy release through the body edges. We show how the enlightened contributions and the presence of edge forces play a relevant role when estimating the $J$-integral of mode I and II crack opening problems.

MSC:
74B20 Nonlinear elasticity
74R10 Brittle fracture
74G65 Energy minimization in equilibrium problems in solid mechanics

Keywords:
cracks; fracture; Noether’s theorem; stress concentration

Full Text: DOI

References:

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