APPLICATION OF THICK LEVEL-SET METHOD TO STUDY OF DYNAMIC FRAGMENTATION

Andrew J. Stershic[1]*, John E. Dolbow[2] and Nicolas Moës[3]

[1] Duke University, Durham, North Carolina, USA, andrew.stershic@duke.edu
[2] Duke University, Durham, North Carolina, USA, jdolbow@duke.edu
[3] École Central de Nantes, Nantes, France, nicolas.moes@ec-nantes.fr

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The Thick Level-Set (TLS) model was introduced as an alternative method to model damage growth in solid mechanics [1][2]. It is a promising new method in the field of damage and failure mechanics due to the efficiency and robustness of having a single level-set function that defines the extent and severity of regions of damage within the domain. This allows for straightforward implementation and evaluation of crack nucleation and merging. Further, the TLS approach introduces a length scale: the length of the region of damage gradient, in contrast to cohesive-zone model (CZM) approaches which require an artificial traction-separation law defined by two parameters. This method is applied to brittle fragmentation problems in a dynamic setting to compare results against CZM approaches as well as theoretical solutions [3][4].

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