

COHESIVE SURFACE MODELING

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The basis of cohesive surface modeling is to consider a continuum as consisting of both volumes and surfaces and provide a constitutive relation for each. Because the volumetric mechanical constitutive relation involves stresses and strains and the surface relation involves tractions and displacement jumps, a length scale is introduced. The basic ideas of a cohesive surface formulation can be traced back to the pioneering contributions of Barenblatt, Dugdale and Hillerborg for crack mechanics. These ideas have been generalized so that an initial crack is not required and a variety of cohesive constitutive relations can be considered. In this lecture an overview of cohesive surface modeling and its applications will be presented. Applications to a variety of problems will be discussed along with advantages and disadvantages of the cohesive framework.

Keywords: constitutive relations; cohesive surfaces; size effects; deformation; fracture;