DUCTILE FRACTURE OF METAL WITH EULERIAN HYDROCODE

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Continuous behavior from a uniformly deformed state to fracture in ductile metal specimen is a typical example of a plastic instability phenomenon [1]. This plastic instability phenomenon is accepted as fundamental cause for instability in a material or structural level. Therefore, explicating this instability behavior in detail is indispensable for understanding ultimate characteristics for the metal specimen, and for investigating structural ductility. A great deal of related computational techniques have also been developed to simulate the shear band formation leading to the ultimate fracture [2][3][4].

We are, however, unable to simulate fracture behavior unless we employ special algorithm such as double nodes in the conventional Lagrangian code for solid analysis. In contrast to the Lagrangian code, the Eulerian code fixes computational meshes and materials flow through the fixed meshes. The Eulerian code is a attractive tool for an analysis of ultimate fracture through strain localization. This is because the Eulerian code allows arbitrary large deformations and new free surfaces without a special algorithm [5]. In this study, the ductile fracture of metal specimens is simulated with Eulerian Hydrocode.

References

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