

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Structures I - Development and Verification (Space Vehicles and Components) (1)

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ANALYSIS METHOD OF STRUCTURAL FRACTURE BEHAVIOR

Abstract

Plenty of structural fracture problems exist in aerospace field. Accurate evaluation the structural fracture behavior plays an important role on space vehicles flight testing. In this paper, we introduce an extended finite element (abbreviated as X-FEM) method for structural fracture behavior within the finite element software ABAQUS. To problems in linear elastic fracture mechanics and non-linear frictional contact analyses were realized. The X-FEM method was used to analysis the 2-D fracture behavior of weld nugget of diaphragm elastic elements, within different sizes. In addition, simulation was carried out on the fracture process of 3-D geometrical model of pyrotechnic valve. Through comparing the results to experimental data, several numerical examples in fracture mechanics are presented to demonstrate the benefits of the proposed method.