

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

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INVERSE ESTIMATION ON ELASTIC PARAMETER OF PARTICULATE REINFORCED
COMPOSITES BASED ON CAX

Abstract

Particulate Reinforced Composites (PRC) such as propellant has been applied widely in space launcher. Considering the fluctuating of components as well as the complexity of molding technology, dispersion of mechanics performance which is interesting for both designer and fabricant, is distinct for PRC vessel. It is reported that experiential expression can be formulated between capability and structural as well as performable parameters. However, batch diversity and single product's peculiarity was hardly obtained in manufactory. In this paper, General Regression Neural Network (GRNN) is introduced to establish inverse estimation method on elastic parameter for solid rocket motor (SRM) grain. Basing displacement information from characteristic points, sample building method is put forward by finite element numerical experiment. Multidisciplinary software such as ABAQUS, EXCEL, are integrated in Matlab. After error evaluating, the inverse estimation method is performed to analyze vertical storage test of a certain grain. Consequently, the flexibility and versatility of the method are distinctly.