A STUDY OF OPTION OF MATERIAL FATIGUE PROPERTY DESCRIPTION FOR FATIGUE LIFE PREDICTION

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Abstract

This paper investigates some new characteristics of cyclic hardening/softening behavior of airframe materials. A new method is presented, which is applied to describe the cyclic stress~strain behavior at any strain ratio, strain range and number of cycles. The comparison is made among different options of fatigue property descriptions. The conclusions are drawn as following: (1)There is no real 'stable' hysteresis curves in transient cyclic stress~strain behavior. (2)It is not acceptable to adopt Manson-Coffin formula to predict the fatigue life for asymmetric cyclic strain. (3)Applying local stress-strain method to predict the fatigue life, the option of transient stress~strain curve combined with equivalent strain~life curve is more reasonable at present.