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MECHANISM OF IMPROVING AERODYNAMIC STABILITY CHARACTERISTICS OF A
RE-ENTRY CAPSULE

Abstract

A numerical investigation on the mechanism of improving the aerodynamic stability characteristics of a re-entry capsule has been performed. The basic configuration of the capsule was found to have a secondary statically stable trim point, which is highly undesirable since it would cause disastrous result once the vehicle flies at the secondary trim point during re-entry. In order to improving the aerodynamic stability characteristics under reasonable center of gravity range, a series of protuberance designs added on the basic configuration have been investigated. The numerical simulation results indicate that these designs are all effective in reducing the strength of the undesirable trim condition with reasonable location of center of gravity.