

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Technologies for Future Space Transportation Systems (5)

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KEY AERODYNAMIC TECHNOLOGIES FOR THE REUSABLE SPACE TRANSPORTATION  
SYSTEM

**Abstract**

The reusable space transportation system is one of the major technology development directions for modern spacecraft. Abundant researches have been conducted in this field at home and abroad for decades. Up to now, the reusable degree of the orbiter still has great limitations due to the specialty of STS propulsion system and the severe aerodynamic/thermodynamic environment during hypersonic reentry. Difficulties of designing the reusable STS are the propulsion subsystem, the thermal protection subsystem and the recovery concept, demanding low cost under the precondition of high reliability. A survey on key aerodynamic technologies for the reusable STS is carried out followed by the introduction of a series of famous research programs and vehicles. The analysis is valuable for the research of future STS.