

MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
Specialised Technologies, Including Nanotechnology (8)

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TOPOLOGICAL STRUCTURES ANALYSIS FOR HYPERSONIC FLOWS AROUND HTV-TYPE  
AIRCRAFT**Abstract**

The hypersonic flows of high attack angle over HTV-type aircraft were simulated by solving NS equations with slip boundary conditions using AUSM+UP scheme. The topological structures of hypersonic flow-field based on the limiting streamline of surface and sectional flow patterns perpendicular to the body axis were analyzed. The results show that with the angle of attack increasing from -10 degree to 40 degree, the structure of limiting streamline of leeward surface changes for non-separating to separating which occurs from the combined-point. At the same time, the aerodynamic channels couples strongly and the separating area of upper wing surface increasing with the angle of attack increasing.