

ABSTRACT

HyperPASS™, a New Aeroassist Tool

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A new software tool designed to perform aeroassist studies has been developed by Global Aerospace Corporation (GAC). The Hypersonic Planetary Aeroassist Simulation System (HyperPASS™) enables users to perform guided aerocapture, guided ballute aerocapture, aerobraking, orbit decay, or unguided entry simulations at any of six planets (Venus, Earth, Mars, Jupiter, Titan, or Neptune). HyperPASS™ a 4th order Runge-Kutta, 2D analysis package ideally suited for preliminary mission design and technology assessment. HyperPASS™ is currently being used for trade studies to investigate (1) aerocapture performance with alternate aeroshell types, varying flight path angle and entry velocity, different g-load and heating limits, and angle of attack and angle of bank variations; (2) variable, attached ballute geometry; (3) railgun launched projectile trajectories, and (4) preliminary orbit decay evolution. After completing a simulation, there are numerous visualization options in which data can be plotted, saved, or exported to various formats. Several analysis examples will be described.