

Abstract Submitted
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Characterizing the flow field around ballutes of various geometries.¹ JEFFREY PANKO, MARIA-ISABEL CARNASCIALI, University of New Haven — A ballute combines the performance of large parachutes with the rigidity and design flexibility of aeroshells. Such designs, when optimized, could drastically increase the allowable payload for interplanetary missions associated with high reentry velocities, for which, the current capabilities of thermal protection systems are being reached. Using commercially available software, a CFD investigation into the flow phenomena and performance characteristics of various such designs was conducted in order to determine features which may prove conducive for use in aerocapture missions, a primary application of such technology. Concerns around current ballute designs stem from the aerodynamic heating loads and flow instabilities at reentry velocities and as such, the study revolved around geometries which would provide favorable performance under such environments. Design parameters included: blunt versus sharp bodies, boundary layer control, and turbulence model. Results were monitored for changes in lift to drag ratios (L/D), separation point, vortex shedding, and control authority.

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