

OVERFLOW Simulations of Space Shuttle Orbiter Reentry Based on As-Built Geometry

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I. Abstract/Summary

The Space Shuttle Orbiters Discovery and Endeavor have been digitally scanned to obtain outer mold line surfaces. Using these scans, the existing overset computational fluid dynamics (CFD) grid system will be modified by projecting the grid points to the scanned geometry. Simulations will be performed using the OVERFLOW solver and the results compared to previous OVERFLOW results on the theoretical geometry and the aerodynamic databook. The “bent airframe” term will be compared between the aerodynamic databook and the computations over a range of reentry conditions.

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II. Preliminary Orbiter Digital OML Surface Images

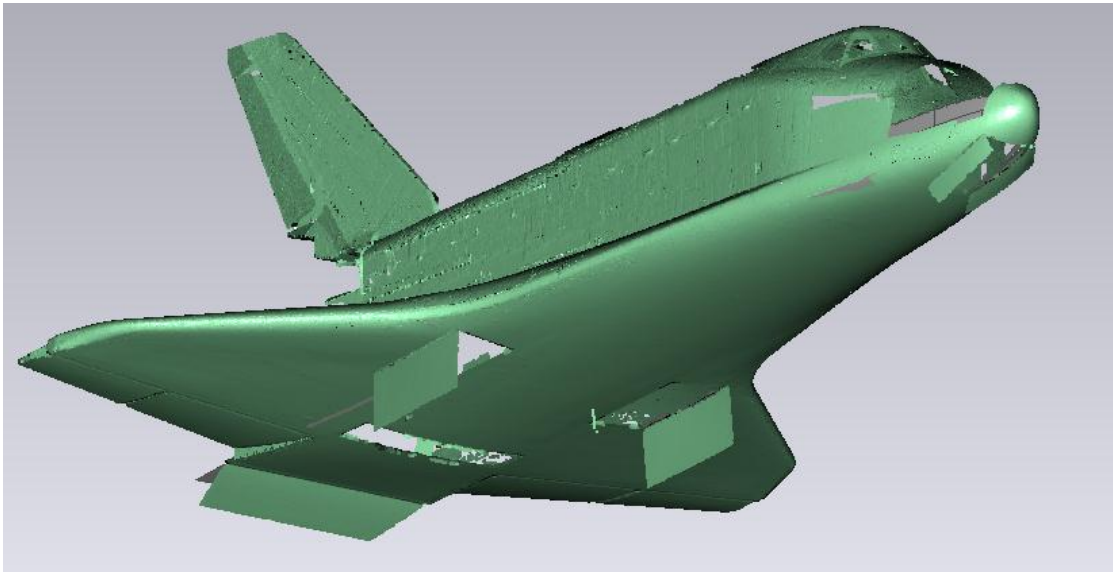


Figure 1. Digital Outer Mold Line surface isometric view of *Endeavor* with gear doors open.

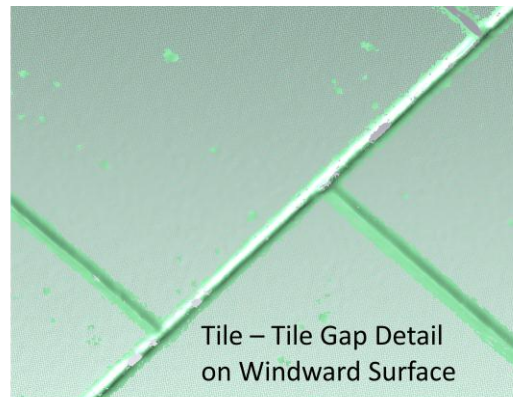


Figure 2. OML surface detail images depicting several tiles, and tile to tile step and gap region.

Acknowledgments

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