

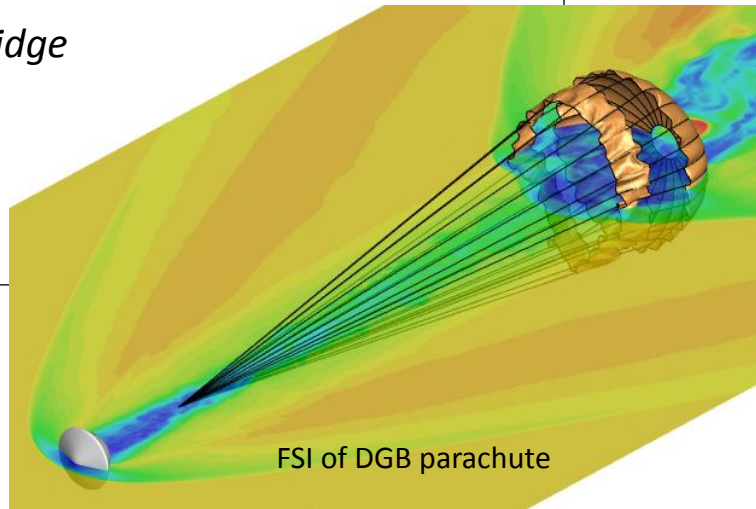
Adaptive FSI of dynamic loading of flexible parachutes using strongly coupled shell mechanics and large-eddy simulation with analytical curvilinear hybrid meshing

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Research Objectives

- Develop coupled compressible fluid/thin fabric mechanical models using lightweight conforming meshing
- Innovation by use of hybrid analytical meshing coupled to classical adaptive approaches
 - Research is beyond state of the art in FSI coupling and meshing
 - TRL 2 (current capability) to TRL 3 (thanks to better meshing and more efficient numerics)

Approach

- Shell mechanics for large deformations
- Large-eddy simulation of turbulence
- Adaptive Mesh Refinement (AMR) for intermediate device scale fidelity
- Semi-analytical conforming lightweight gridding around structure for better flow/structural accuracy
- Parallel based environment (MPI)

Potential Impact

- Resulting framework will be sufficiently accurate to reproduce most failure modes
- Large saving by reducing full scale testing to very refined designs