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Flow in the near wake of hemispherical parachute shapes JEFFREY YOUNG, MARIA-ISABEL CARNASCIALI, Univestity of New Haven, MIKE KANDIS, Pioneer Aerospace — A CFD study was conducted using ANSYS to investigate the pitch-stability of several hemispherical parachute geometries at varying Reynolds numbers. In actuality, the parachute itself is not a rigid body and large variations in the parachute geometry can occur due to the flexibility of the parachute fabric. This factor combined with flow through gaps/open areas provide for a much more complex wake than that of a simple bluff body like a disc or sphere. In some cases, Vortex Shedding or alternating vortices are generated which cause oscillations in the axial (i.e., drag force) and normal (i.e., lift force) forces that lead to pitching/oscillations. This study investigated the flow in the near wake of hemispherical parachute shapes (assumed to be rigid) having various sized gaps/open areas positioned at distinct locations to determine which designs resulted in "less severe" Vortex Shedding. The design features (i.e., size and location of the gaps) that provided the smallest variation/fluctuation in the normal forces were identified and compared to actual parachute designs.

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