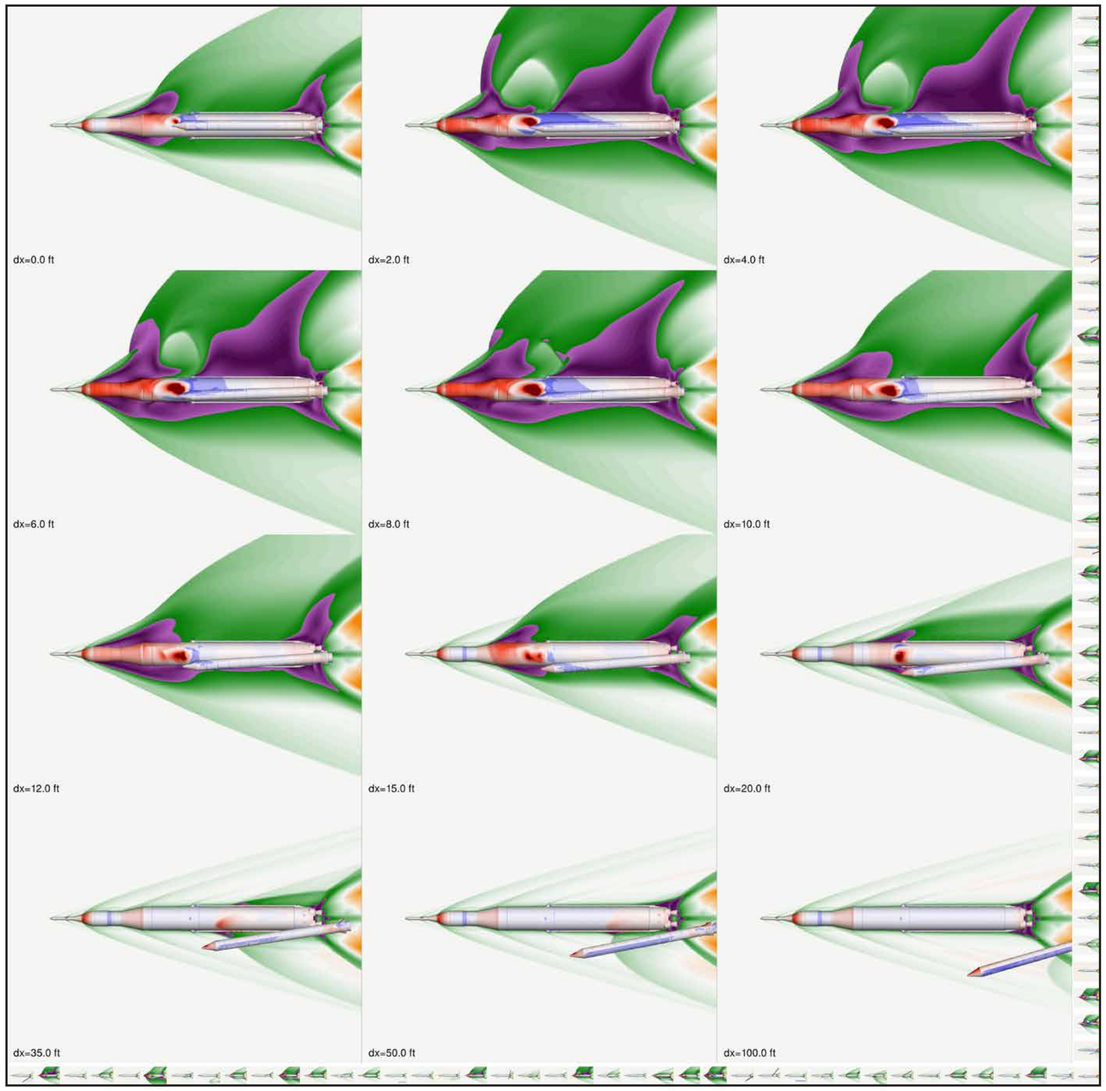
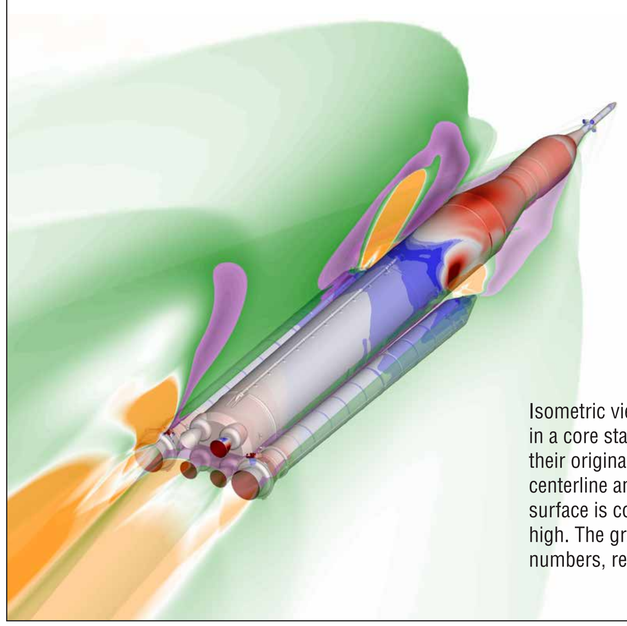


Sequential images showing a side view of the nominal flight conditions for Artemis II through the first 100 feet of booster separation. The right and bottom borders show the same view of a random selection of the more than 13,000 simulations that were run to create aerodynamic databases. The vehicle surface is colored by pressure contours, where blue is low and red is high. The background slice illustrates local Mach number. The green and orange colors represent low and high Mach numbers, respectively. *Jamie Meeroff, Derek Dalle NASA/Ames*



Isometric view of the Artemis II vehicle, simulating the effect of a failure in a core stage engine with the boosters four feet downstream from their original, attached position. Slices of the flow are taken on vehicle centerline and through the left booster's separation motors. The vehicle surface is colored by pressure contours, where blue is low and red is high. The green and orange colors represent low and high Mach numbers, respectively. *Stuart Rogers, Henry Lee, NASA/Ames*

National Aeronautics and Space Administration

Building Booster Separation Aerodynamic Databases for Artemis II

NASA's Artemis II mission will mark the return of humans to near-lunar space for the first time since Apollo. Shortly after launch on the Space Launch System (SLS), a critical phase of ascent occurs when 16 small rockets fire to push the boosters away from the core. Minimizing the risk of failure during separation requires the construction of multiple 13-dimensional databases, including perturbations in position, flight conditions, and engine thrust. The SLS Computational Fluid Dynamics team used NASA's FUN3D flow solver on the Pleiades and Electra supercomputers to run 5,780 simulations at nominal conditions and over 8,000 simulations with a core stage engine failure to generate the databases needed to verify the booster separation system for Artemis II.

Jamie Meeroff, NASA Ames Research Center
Derek Dalle, NASA Ames Research Center

NASA EXPLORES HUMAN SPACE FLIGHT