NASA High Fidelity CFD Workshop

To be held May 20-22, 2025
Lockheed Martin Center for Innovation
Suffolk, VA

NASA's CFD Vision 2030 Study[1], and the subsequent Certification by Analysis 2040 Study[2], emphasized the need for development of advanced computational tools that are robust, efficient (cost effective) and accurate. For computational fluid dynamics (CFD) tools to provide accurate prediction near the edges of the flight envelope (e.g., high-lift), high-fidelity scale-resolving computational tools are needed. The Revolutionary Computational Aerosciences (RCA), under NASA's Transformational Tools and Technologies (TTT) Project, has been engaged in sponsoring such tool development along with experiments to provide CFD validation data. RCA has a technical challenge, maturing in September 2025, to develop and demonstrate computationally efficient, eddy-resolving modeling tools that predict maximum lift coefficient for transport aircraft with the same accuracy as certification flight tests. The focus of the RCA research toward accomplishing this challenge, within NASA and the sponsored extramural research, has been aimed at developing and demonstrating wall-modeled large-eddy simulation (WMLES) capability. In addition, RCA's research portfolio includes generation of CFD validation data, grid generation, computational aeroelasticity, high-order methods, data-driven modeling, laminar-turbulent transition, direct numerical simulation, and uncertainty quantification. In this workshop, RCA research accomplishments (both within NASA and sponsored) will be presented to enhance collaboration among research teams. Toward that end, leading independent CFD researchers will also be invited to participate in the workshop and present their research on WMLES, hybrid RANS/LES and use of machine learning for improved modeling. This workshop will provide an opportunity to assess progress made since the CFD Futures Conference organized by RCA in 2012.

For additional information, please contact Mujeeb Malik (m.r.malik@nasa.gov) or Gary Coleman (g.n.coleman@nasa.gov).

Attendees of CFD Futures Conference held in Hampton VA in August 2012.

1. https://ntrs.nasa.gov/api/citations/20140003093/downloads/20140003093.pdf
2. https://ntrs.nasa.gov/api/citations/20210015404/downloads/NASA-CR-20210015404%20updated.pdf