Agenda for TTT-RCA High-Fidelity CFD Workshop, May 20-22, 2025
Lockheed-Martin Center for Innovation (The Lighthouse)
8000 Harbourview Boulevard, Suffolk, VA 23435

RCA Technical Challenge Statement: 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.

Date	Index	Time	Item	Presenter/Org	Time
20-May			**Day 1**		
		7.15am	**Registration**		
		8.00am	**Welcome: Jill Prince, Director, Research Directorate (NASA LaRC)**		
			Session 1: Chaired by Dr. David Lockard (NASA LaRC)		
	1	8.30am	Overview of RCA research portfolio: Progress toward the Technical Challenge	Mujeeb Malik/LaRC	45
	2	9.15am	Large-eddy simulation of high-lift common research model including grid-resolution and wind-tunnel effects	Parviz Moin/Stanford U	45
	3	10.00am	CRM high-lift simulations using FUN3D	Li Wang/LaRC	30
		10.30am	**Break**		**20**
	4	10.50am	CRM high-lift simulations using LAVA	Emre Sozer/ARC	30
	5	11.20am	Wall-modelled large eddy simulations of CRM-HL configuration in NTF	Cetin Kiris/Volcano Platforms, Inc.	30
	6	11.50am	CFD at the Edges of the Envelop (Invited)	Robert Gregg-III/Boeing	30
		12.20pm	**Group Photo + Lunch**		**70**
			Session 2: Chaired by Dr. Robert Baurle (AFRL)		
	7	1.30pm	Chasing the CFD Vision 2030 Exascale Milestone	Eric Nielsen/NASA LaRC	20
	8	1.50pm	Towards grid-adaptation in wall-modeled large-eddy simulations of realistic aerospace flows	Johan Larsson/U Maryland	20
	9	2.10pm	Scale-resolving turbulence simulations through adaptive high-order discretizations and data-enabled model refinements	Chris Fidkowski/U Michigan	20
	10	2.30pm	High-fidelity simulations in support of analysis and design of aircraft engines (Invited)	Stephan Priebe/GE	25
		2.55pm	**Break**		**20**
	11	3.15pm	Outlook for direct/wall-resolved numerical simulations of transitional transonic, supersonic and hypersonic flows (Invited)	Neil Sandham/U Southampton	25
	12	3.40pm	DNS and hybrid RANS/LES of canonical configurations	Ali Uzun/LaRC (AMA)	20
	13	4.00pm	WMLES of the Boeing speed bump	Prahladh Iyer/LaRC (AMA)	20
	14	4.20pm	Advances in subgrid-scale and wall modeling for large-eddy simulations of complex, separating flows	Rahul Agrawal/Stanford U	20
	15	4.40pm	Enabling industrially relevant high-fidelity CFD and AI surrogate models for external aerodynamics (Invited)	Neil Ashton/Nvidia	25
		5.05pm	**End of Day 1**		
		6.30 PM	**[no host] Group Dinner**		
21-May					
		7.30am	**Start of Day 2**		
			Session 3: Chaired by Professor Z J Wang (University of Kansas)		
	16	8.00am	For What the Bell Tolls: Computational efficiency through tuned approximation (Invited)	David Keyes/KAUST	30
	17	8.30am	Glenn flux reconstruction (GFR) development	Seth Spiegel/GRC	25
	18	8.55am	Stabilized finite-elements in FUN3D	Kyle Anderson/LaRC	25
	19	9.20am	Entropy-stable numerical schemes	Mark Carpenter/LaRC	25
	20	9.45am	Advancements in solver technology	Boris Diskin/LaRC	25
		10.10am	**Break**		**20**
	21	10.30am	Matrix and tensor reduced-order modeling for accelerating high-fidelity CFD simulations	Hessam Babae/U Pittsburgh	30
	22	11.00am	Uncertainty quantification – QUEST	Marian Nemec/ARC	25
	23	11.25am	Advances in multi-fidelity uncertainty quantification to support certification by analysis in the separated-flow regime	Alex Gorodetsky/U Michigan	25
	24	11.50pm	Quantum-ready and quantum-inspired CFD	Peyman Givi/U Pittsburgh	25
		12.15pm	**Lunch**		**55**
			Session 4: Chaired by Dr. Cornelia Grabe (DLR)		
	25	1.10pm	Integrated boundary-layer transition prediction	Meelan Choudhari/LaRC	30
	26	1.40pm	Building-block flow model: An ML-based general-purpose closure model for large-eddy simulation (Invited)	Adrian Lozano-Duran/CalTech	30

27	2.10pm	Toward a generalizable RANS model for separation using field inversion and machine learning	Gary Coleman/LaRC	20
28	2.30pm	An efficient data-driven approach for assessment and selection of Reynolds-stress-equation closure models	Ali Mani/Stanford U	20
	2.50pm	**Break**		**20**
29	3.10pm	Developments in automation of overset structured mesh generation	William Chan/ARC	20
30	3.30pm	Toward adaptive mixed-element unstructured grids for simulations of viscous flows	Gabe Nastac/LaRC	20
31	3.50am	Development of Voronoi grid capability for WMLES	Victor Sousa/ARC	20
32	4.10pm	Dynamic AMR for WMLES of complex configurations	Dimitri Mavriplis/Scientific Simulations	20
33	4.30pm	Fully automated large-eddy simulation of JAXA standard model and Mitsubishi SpaceJet high-lift configurations (Invited)	Soshi Kawaii/Tohoku U	20
34	4.500pm	JAXA's CFD and modeling efforts for off-design conditions (Invited)	Hiroyuki Abe/JAXA	20
	5.10pm	**End of Day 2**		

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	7.30am	**Start of Day 3**		
		Session 5: Chaired by Professor Karthik Duraisamy (University of Michigan)		
35	8.00am	BeVERLI - The experiment, the challenge, and community engagement	Chris Roy/VA Tech	20
36	8.20am	CRM-HL Ecosystem	Adam Clark/Boeing	20
37	8.40am	NTF experiments on the CRM-HL configuration	Courtney Winski/LaRC	20
38	9.00am	High-lift flow physics experiment	Dan Neuhart/LaRC	20
39	9.20am	The THX experiments	Nick Georgiadis/GRC	20
40	9.40am	Shock/boundary-layer interaction experiments	Heath Reising/GRC	20
	10.00am	**Break**		**20**
41	10.20am	Transition experiments	Jenna Eppink/LaRC	20
42	10.40am	Aeroelastic analysis with FUN3D	Kevin Jacobson/LaRC	20
43	11.00am	Buffet onset prediction with FUN3D	Emmett Padaway/LaRC	20
44	11.20pm	Transonic buffet prediction in LAVA	Jared Duensing/ARC	20
45	11.40am	Towards GPU-enabled structural analysis tools for aeroelastic certification by analysis	Graeme Kennedy/GA Tech	20
	12.00pm	**Lunch**		**60**
	1.00pm	**Group Discussion: The discussion will be focused on three questions given below.**	Moderated by Jeff Slotnick and Chris Rumsey	
		1. What capabilities have been developed and established for accurately predicting aircraft CLmax, and what are the remaining gaps in our capabilities and understanding? **2. What should be the target application for future CFD developments (the new NASA Revolutionary Computational Aerosciences Technical Challenge) to further advance computational capabilities and why?** **3. What are the key emerging technologies that will likely influence the success of the new Technical Challenge? How should the CFD community explore, develop, and deploy these technologies?** **We will use the following process for the discussion:** **The attendees will be divided into three groups, led by Johan Larsson, Dmitri Mavriplis, and Neil Ashton, each of which will address the above three questions. After about an hour of discussion, and a short break, we will meet back as a single group, and each Leader will report out. One question will be addressed at a time, and we will try to reach broad consensus on each of the three questions.**		
	5.00pm	**End of Workshop**		