

Publications Listing

CLD Flame: Coflow Laminar Diffusion Flames in a Microgravity Environment

PI: Marshall B. Long, Yale University

Co-I: Mitchell D. Smooke, Yale University

SLICE: Structure & Liftoff In Combustion Experiment

PI: Marshall B. Long, Yale University

Co-Is: Mitchell D. Smooke, Yale University
Fumiaki Takahashi, National Center for Space Exploration Research
Dennis P. Stocker, NASA Glenn Research Center

Submitted by: Marshall Long

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The SLICE experiment is a precursor to the CLD Flame experiment where the latter is now in development for conduct in the Combustion Integrated Rack (CIR) on the International Space Station as part of the Advanced Combustion via Microgravity Experiments (ACME) program.

Peer-Reviewed Journal Papers

1. M.D. Smooke, R.J. Hall, M.B. Colket, J. Fielding, M.B. Long, C.S. McEnally, and L.D. Pfefferle, "Investigation of the Transition from Lightly Sooting towards Heavily Sooting Coflow Ethylene Diffusion Flames," *Combust. Theory Modelling* **8**, p. 593–606 (2004).
2. K.T. Walsh, J. Fielding, M.D. Smooke, M.B. Long, and A. Linan, "A Comparison of Computational and Experimental Lift-Off Heights of Coflow Laminar Diffusion Flames," *Proc. Comb. Inst.*, **30**, 1555-1563 (2005).
3. M.D. Smooke, M.B. Long, B.C. Connelly, M.B. Colket and R.J. Hall, "Soot Formation in Laminar Diffusion Flames," *Combust. Flame* **143**, 613-628 (2005).

4. S.B. Dworkin, B.C. Connelly, A.M. Schaffer, M.B. Long, M.D. Smooke, M.P. Puccio, B. McAndrews and J.H. Miller, "Computational and Experimental Study of a Forced, Time-Dependent, Methane-Air Coflow Diffusion Flame," *Proc. Comb. Inst.*, **31**, 971-978 (2007).
5. S. B. Dworkin, A. M. Schaffer, B. C. Connelly, M. B. Long and M. D. Smooke, M. A. Puccio, B. McAndrew, and J. H. Miller, "Measurements and Calculations of Formaldehyde Concentrations in a Methane/N₂/Air, Non-Premixed Flame: Implications for Heat Release Rate," *Proc. Comb. Inst.*, **32**, 1311–1318 (2009).
6. B. C. Connelly, M. B. Long, M. D. Smooke, R. J. Hall, and M. B. Colket, "Computational and Experimental Investigation of the Interaction of Soot and NO_x in Coflow Diffusion Flames," *Proc. Comb. Inst.*, **32**, 777–784 (2009).
7. B. C. Connelly, B. A. V. Bennett, M. D. Smooke and M. B. Long, "A Paradigm Shift in the Interaction of Experiments and Computations in Combustion Research," *Proc. Comb. Inst.*, **32**, 879–886 (2009).
8. S.B. Dworkin, J.A. Cooke, B.A.V. Bennett, B.C. Connelly, M.B. Long, M.D. Smooke, R.J. Hall and M.B. Colket, "Distributed-memory parallel computation of a forced, time-dependent, sooting, ethylene/air coflow diffusion flame," *Combustion Theory and Modelling*, **13**, 795 - 822 (2009).
9. P. B. Kuhn, B. Ma, B. C. Connelly, M. D. Smooke, and M. B. Long, "Soot and Thin-filament Pyrometry Using a Color Digital Camera," *Proceedings of the Combustion Institute*, **33**, 743-750 (2011).
10. M. B. Long, "Imaging Flames: From advanced laser diagnostics to snapshots," in *Optical Processes in Microparticles and Nanostructures*, A. Serpengüzel and A.W. Poon, Editors. 2011, World Scientific.
11. J.D. Herdman, B.C. Connelly, M.D. Smooke, M.B. Long and J.H. Miller, "A comparison of Raman signatures and laser-induced incandescence with direct numerical simulation of soot growth in non-premixed ethylene/air flames," *Carbon*, **49**, 5298-5311 (2011).

Conference Proceedings and Posters

1. M.D. Smooke, K.T. Walsh, J. Fielding, M.B. Long, and A. Linan, "A Comparison of Computational and Experimental Lift-Off Heights of Coflow Laminar Diffusion Flames," presented at the *Thirtieth International Symposium on Combustion*, Chicago, IL, July 25-30, 2004.

2. B.C. Connelly, S.A. Kaiser, M.D. Smooke, and M.B. Long, "Two-dimensional Soot Pyrometry with a Color Digital Camera," *Proceedings of the Joint Meeting of the U.S. Sections of the Combustion Institute*, Drexel University, Philadelphia, PA, March 2005.
3. M. D. Smooke, B. C. Connelly, M. B. Long, M. E. Colket and R. J. Hall, "Computational and Experimental Study of Ethylene-Air Diffusion Flames," *Proceedings of the Joint Meeting of the U.S. Sections of the Combustion Institute*, Drexel University, Philadelphia, PA, March 2005.
4. M. D. Smooke, M. B. Long, B. C. Connelly, M. E. Colket and R. J. Hall, "Soot Formation in Ethylene-Air Diffusion Flames," *Sandia National Laboratories Workshop on Soot Formation*, Livermore, CA, April 2005.
5. B.C. Connelly, S.A. Kaiser, M.D. Smooke, and M.B. Long, "Advances in Two-dimensional Soot Pyrometry with a Color Digital Camera," Gordon Research Conference on Laser Diagnostics for Combustion, Wellesley, MA, August 2005.
6. B.C. Connelly, B.A. Bennett, S.B. Dworkin, M.D. Smooke, M.B. Long, M.A. Puccio, J.D. Herdman, J.H. Miller, "Computational and Experimental Study of Molecular Growth in Forced, Time-Varying Flames" *Proceedings of the Eastern States Section of the Combustion Institute*, University of Central Florida, Orlando, FL, November 2005.
7. S. B. Dworkin, B. C. Connelly, B. A. V. Bennett, A. M. Schaffer, M. B. Long, M. D. Smooke, M. P. Puccio, B. McAndrews and J. H. Miller, "Application of a Modified Vorticity-Velocity Formulation to Steady and Unsteady Laminar Diffusion Flames," *Journée des Doctorants du CMAP*, Palaiseau, France, March 7, 2007.
8. B.C. Connelly, M.D. Smooke, M.B. Long, R.J. Hall, and M.B. Colket, "Computational and Experimental Investigation of the Interaction of Soot and NO_x in Coflow Diffusion Flames," *Proceedings of the 5th US Combustion Meeting*, University of California at San Diego, San Diego, CA, March 25-28, 2007.
9. B.C. Connelly, B.A.V. Bennett, S. B. Dworkin, M.D. Smooke and M. B. Long, "A Paradigm Shift in the Interaction of Experiments and Computations in Combustion Research," *Gordon Research Conference on Laser Diagnostics in Combustion*, Magdalen College, Oxford, UK, August 12-17, 2007.
10. M.B. Long, B.C. Connelly, B.A.V. Bennett and M.D. Smooke, "A Paradigm Shift in the Interaction of Experiments and Computations," *First International SAOT Workshop on Optical Diagnostics for Flow and Combustion Research*, Erlangen, Germany, August 19-21, 2007.
11. M.D. Smooke, "Computational and experimental study of soot formation in coflow diffusion flames." Invited talk at *Eastern States Section of the Combustion Institute, Technical Meeting*, Charlottesville, Virginia, October 21-24, 2007.
12. B.C. Connelly, B.A.V. Bennett, M.D. Smooke and M. B. Long, "A Paradigm Shift in the

Interaction of Experiments and Computations in Combustion Research,” *Eastern States Section of the Combustion Institute, Technical Meeting*, Charlottesville, Virginia, October 21-24, 2007.

13. M. B. Long, “Probing Fire with Light,” guest lecture at The Summer Science Program, Socorro, NM, July 3, 2007.
14. “Changing the way we think about combustion experiments – the interaction of computations and experiments,” Mechanical Engineering Seminar, University of Connecticut, 17 April 2009.
15. Blair Connelly, Peter Kuhn, Bin Ma, and Marshall Long, Current state of combustion diagnostics on the International Space Station,” Gordon Research Conference of Laser Diagnostics of Combustion, Waterville Valley, NH, 16-21 August 2009.
16. Blair C. Connelly, Luca Tosatto, Mitchell D. Smooke and Marshall B. Long, “Improving the interface between experiments and computations through intelligent experimental design,” Gordon Research Conference of Laser Diagnostics of Combustion, Waterville Valley, NH, 16-21 August 2009.
17. Blair C. Connelly, Marshall B. Long, Mitchell D. Smooke, Meredith B. Colket, Robert J. Hall, “Two-dimensional laser-induced incandescence for soot volume fractions and primary particle size distributions,” 6th U.S. National Combustion Meeting, The University of Michigan, Ann Arbor, Michigan, 17-20 May 2009.
18. Marshall B. Long, “Imaging Flames: From Advanced Laser Diagnostics to Snapshots,” Plenary Lecture at the Eastern States Section of the Combustion Institute, Fall Technical Meeting, University of Maryland, College Park, 18-21 October 2009.
19. B. Ma, S. Cao, B. A. V. Bennett, M. D. Smooke and M. B. Long, “Experimental and computational study of lifted coflow laminar diffusion flames under elevated pressures,” 7th US National Technical Meeting of the Combustion Institute, Atlanta, GA, March 20-23, 2011.
20. Marshall B. Long, “Multispectral Imaging in Combustion Analysis,” Invited presentation at OSA Advanced Photonics Congress, Toronto, Canada, 12-15 June 2011.
21. Jennifer D. Herdman, Blair C. Connelly, Mitchell D. Smooke, Marshall B. Long and J. Houston Miller, A comparison of Raman signatures and laser- induced incandescence with direct numerical simulation of soot growth in non-premixed ethylene/air flames,” Gordon Research Conference of Laser Diagnostics of Combustion, Waterville Valley, NH, 14-19 August 2011.
22. Bin Ma and Marshall B. Long, “Can SiC Fibers Serve As An Absolute Light Calibrator?” Gordon Research Conference of Laser Diagnostics of Combustion, Waterville Valley, NH, 14-19 August 2011.
23. B. Ma and M. B. Long, “Absolute light calibration in combustion experiments,” Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Storrs, CT Oct 9-12, 2011.

24. Su Cao, Beth Anne V. Bennett, Bin Ma, Marshall B. Long, Mitchell D. Smooke, "Computational and experimental study of laminar coflow methane-air diffusion flames under elevated pressures ," Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Storrs, CT Oct 9-12, 2011.

Ph.D. Dissertation

B.C. Connelly, "Quantitative Characterization of Steady and Time-Varying, Sooting, Laminar Diffusion Flames using Optical Techniques," Ph.D. Thesis, Yale University, 2009.