ACME Peer-Reviewed Publications

Advanced Combustion via Microgravity Experiments (ACME)

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Peer-reviewed publications resulting from the ACME project are listed on subsequent pages by investigation. The Principal Investigators (PIs), Co-Investigators (Co-Is), and lead Russian collaborators are identified below, where those marked with an asterisk are former investigators. The period of ISS operations is also shown, where initial ACME operations began in Sept. 2017 with the general set-up and that required for the first round of tests for the CLD Flame experiment.

- **Burning Rate Emulator** (BRE), page 2
    - PI: James G. Quinitiere (U. Maryland)
    - Co-Is: Peter B. Sunderland, John L. de Ris
    - Lead Russian collaborator: Alexander Y. Snegirev
    - ISS operations: Jan.-April 2019, July 2020–Jan. 2021
- **Coflow Laminar Diffusion Flame** (CLD Flame), page 3
    - PI: Marshall B. Long (Yale U.)
    - Co-I: Mitchell D. Smooke
    - Lead Russian collaborator: Sergey S. Minaev
    - ISS operations: Nov. 2017–Feb. 2018, May-Sept. 2018, Feb.-March 2021
- **Cool Flames Investigation with Gases** (CFI-G), page 5
    - PI: Peter B. Sunderland (U. Maryland)
    - Co-Is: Richard L. Axelbaum, Forman A. Williams
    - Lead Russian collaborator: *none*
    - ISS operations: March-Oct. 2021
- **Electric-Field Effects on Laminar Diffusion Flames** (E-FIELD Flames), page 5
    - PI: Derek Dunn-Rankin (UC Irvine)
    - Co-Is: Sunny Karnani, Felix J. Weinberg*, Zeng-Guang Yuan*
    - Lead Russian collaborator: Sergey S. Minaev
    - ISS operations: March-May 2018, Sept.-Nov. 2018
- **Flame Design** (Flame Design), page 6
    - PI: Richard L. Axelbaum (Washington U. in St. Louis)
    - Co-Is: Peter B. Sunderland, David L. Urban, Beei-Huan Chao*
    - Lead Russian collaborator: Sergei M. Frolov
    - ISS operations: April-July 2019, Oct. 2021–Feb. 2022
- **Structure and Response of Spherical Diffusion Flames** (s-Flame), page 9
    - PI: Chung K. Law (Princeton U.)
    - Co-Is: Stephen D. Tse, Kurt R. Sacksteder
    - Lead Russian collaborator: Vladimir V. Gubernov
    - ISS operations: July 2019–Jan. 2020, April-July 2020

Publications including ISS results are outlined, where that includes papers with results from the CLD Flame precursor, Structure & Liftoff In Combustion Experiment (SLICE), which operated in the Microgravity Science Glovebox (MSG) in Jan.-March 2012.

Burning Rate Emulator (BRE)

Includes ISS results

1. Dehghani, P., & Quintiere, J. G. (2023). Flammability maps for microgravity burning of a small flat material in a quiescent ambient. *Combustion and Flame*, *253*, 112809. https://doi.org/10.1016/j.combustflame.2023.112809
2. Dehghani, P., de Ris, J. L., & Quintiere, J. G. (2023). Demonstrating steady burning for small flat materials in microgravity in a quiescent ambient. *Proceedings of the Combustion Institute*, *39*(3), 3949-3958. https://doi.org/10.1016/j.proci.2022.08.107
3. Dehghani, P., & Quintiere, J. G. (2021). Theoretical analysis and predictions of burning in microgravity using a burning emulator. *Combustion and Flame*, *233*, 111572. https://doi.org/10.1016/j.combustflame.2021.111572
4. Dehghani, P., Sunderland, P. B., Quintiere, J. G., & DeRis, J. L. (2021). Burning in microgravity: Experimental results and analysis. *Combustion and Flame*, *228*, 315-330. https://doi.org/10.1016/j.combustflame.2021.01.035
5. Snegirev, A., Kuznetsov, E., Markus, E., Dehghani, P., & Sunderland, P. (2021). Transient dynamics of radiative extinction in low-momentum microgravity diffusion flames. *Proceedings of the Combustion Institute*, *38*(3), 4815-4823. https://doi.org/10.1016/j.proci.2020.06.110
6. Auth, E., Quintiere, J. G., & Sunderland, P. B. (2020). Emulation of condensed fuel flames with gaseous fuels supplied through a porous copper calorimeter. *Fire and Materials*, *44*(7), 935-942. https://doi.org/10.1002/fam.2896
7. Kuznetsov, E. A., Snegirev, A. Y., & Markus, E. S. (2020). Radiative Extinction of Laminar Diffusion Flame above the Flat Porous Burner in Microgravity: A Computational Study. *Combustion, Explosion, and Shock Waves*, *56*(4), 394-411. https://doi.org/10.1134/S0010508220040036
8. Markan, A., Baum, H. R., Sunderland, P. B., Quintiere, J. G., & de Ris, J. L. (2020). Transient ellipsoidal combustion model for a porous burner in microgravity. *Combustion and Flame*, *212*, 93-106. https://doi.org/10.1016/j.combustflame.2019.09.030
9. Markan, A., Sunderland, P. B., Quintiere, J. G., de Ris, J. L., & Baum, H. R. (2019). Measuring heat flux to a porous burner in microgravity. *Proceedings of the Combustion Institute*, *37*(3), 4137-4144. https://doi.org/10.1016/j.proci.2018.05.006
10. Plathner, F. V., Quintiere, J. G., & van Hees, P. (2019). Analysis of extinction and sustained ignition. *Fire safety journal*, *105*, 51-61. https://doi.org/10.1016/j.firesaf.2019.02.003
11. Markan, A., Sunderland, P. B., Quintiere, J. G., de Ris, J. L., Stocker, D. P., & Baum, H. R. (2018). A burning rate emulator (BRE) for study of condensed fuel burning in microgravity. *Combustion and Flame*, *192*, 272-282. https://doi.org/10.1016/j.combustflame.2018.01.044
12. 8 Lundström, F. V., Sunderland, P. B., Quintiere, J. G., van Hees, P., & de Ris, J. L. (2017). Study of ignition and extinction of small-scale fires in experiments with an emulating gas burner. *Fire Safety Journal*, *87*, 18-24. https://doi.org/10.1016/j.firesaf.2016.11.003

13. Zhang, Y., Kim, M., Sunderland, P. B., Quintiere, J. G., & De Ris, J. (2016). A burner to emulate condensed phase fuels. *Experimental Thermal and Fluid Science*, *73*, 87-93. https://doi.org/10.1016/j.expthermflusci.2015.09.025
14. Zhang, Y., Kim, M., Guo, H., Sunderland, P. B., Quintiere, J. G., deRis, J., & Stocker, D. P. (2015). Emulation of condensed fuel flames with gases in microgravity. *Combustion and Flame*, *162*(10), 3449-3455. https://doi.org/10.1016/j.combustflame.2015.05.005
15. Zhang, Y., Bustamante, M. J., Gollner, M. J., Sunderland, P. B., & Quintiere, J. G. (2014). Burning on flat wicks at various orientations. *Journal of fire sciences*, *32*(1), 52-71. https://doi.org/10.1177%2F0734904113495650

Coflow Laminar Diffusion Flame (CLD Flame)

Includes ISS results

1. Dobbins, R. R., Tinjero, J., Squeo, J., Zhao, X., Hall, R. J., Colket, M. B., ... & Smooke, M. D. (2022). A Combined Experimental and Computational Study of Soot Formation in Normal and Microgravity Conditions. *Combustion Science and Technology*, 1-26. https://doi.org/10.1080/00102202.2022.2041621
2. Kempema, N. J., Dobbins, R. R., Long, M. B., & Smooke, M. D. (2021). Constrained-temperature solutions of coflow laminar diffusion flames. *Proceedings of the Combustion Institute*, *38*(2), 1905-1912. https://doi.org/10.1016/j.proci.2020.06.034
3. Cao, S., Ma, B., Giassi, D., Bennett, B. A. V., Long, M. B., & Smooke, M. D. (2018). Effects of pressure and fuel dilution on coflow laminar methane–air diffusion flames: A computational and experimental study. *Combustion Theory and Modelling*, *22*(2), 316-337. https://doi.org/10.1080/13647830.2017.1403051
4. Kempema, N. J., & Long, M. B. (2018). Effect of soot self-absorption on color-ratio pyrometry in laminar coflow diffusion flames. *Optics letters*, *43*(5), 1103-1106. https://doi.org/10.1364/OL.43.001103

Includes ISS results

5. Giassi, D., Cao, S., Bennett, B. A. V., Stocker, D. P., Takahashi, F., Smooke, M. D., & Long, M. B. (2016). Analysis of CH* concentration and flame heat release rate in laminar coflow diffusion flames under microgravity and normal gravity. *Combustion and Flame*, *167*, 198-206. https://doi.org/10.1016/j.combustflame.2016.02.012
6. Giassi, D., & Long, M. B. (2016). Signal-to-noise ratio improvements in laser flow diagnostics using time-resolved image averaging and high dynamic range imaging. *Experiments in Fluids*, *57*(8), 1-10. https://doi.org/10.1007/s00348-016-2218-5

Includes ISS results

7. Cao, S., Ma, B., Bennett, B. A. V., Giassi, D., Stocker, D. P., Takahashi, F., ... & Smooke, M. D. (2015). A computational and experimental study of coflow laminar methane/air diffusion flames: Effects of fuel dilution, inlet velocity, and gravity. *Proceedings of the Combustion Institute*, *35*(1), 897-903. https://doi.org/10.1016/j.proci.2014.05.138
8. Giassi, D., Liu, B., & Long, M. B. (2015). Use of high dynamic range imaging for quantitative combustion diagnostics. *Applied optics*, *54*(14), 4580-4588. https://doi.org/10.1364/AO.54.004580

9. Ma, B., Cao, S., Giassi, D., Stocker, D. P., Takahashi, F., Bennett, B. A. V., ... & Long, M. B. (2015). An experimental and computational study of soot formation in a coflow jet flame under microgravity and normal gravity. *Proceedings of the Combustion Institute*, *35*(1), 839-846. https://doi.org/10.1016/j.proci.2014.05.064
10. Ma, B., & Long, M. B. (2014). Combined soot optical characterization using 2-D multi-angle light scattering and spectrally resolved line-of-sight attenuation and its implication on soot color-ratio pyrometry. *Applied Physics B*, *117*(1), 287-303. https://doi.org/10.1007/s00340-014-5834-x
11. Ma, B., Wang, G., Magnotti, G., Barlow, R. S., & Long, M. B. (2014). Intensity-ratio and color-ratio thin-filament pyrometry: uncertainties and accuracy. *Combustion and Flame*, *161*(4), 908-916. https://doi.org/10.1016/j.combustflame.2013.10.014
12. Ma, B., & Long, M. B. (2013). Absolute light calibration using S-type thermocouples. *Proceedings of the Combustion Institute*, *34*(2), 3531-3539. https://doi.org/10.1016/j.proci.2012.05.030
13. Herdman, J. D., Connelly, B. C., Smooke, M. D., Long, M. B., & Miller, J. H. (2011). A comparison of Raman signatures and laser-induced incandescence with direct numerical simulation of soot growth in non-premixed ethylene/air flames. *Carbon*, *49*(15), 5298-5311. https://doi.org/10.1016/j.carbon.2011.07.050
14. Kuhn, P. B., Ma, B., Connelly, B. C., Smooke, M. D., & Long, M. B. (2011). Soot and thin-filament pyrometry using a color digital camera. *Proceedings of the Combustion Institute*, *33*(1), 743-750. https://doi.org/10.1016/j.proci.2010.05.006
15. Long, M. (2011). Imaging Flames: from Advanced Laser Diagnostics to Snapshots. In *Optical Processes In Microparticles And Nanostructures: A Festschrift Dedicated to Richard Kounai Chang on His Retirement from Yale University* (pp. 65-79). https://doi.org/10.1142/9789814295789_0004
16. Connelly, B. C., Bennett, B. A. V., Smooke, M. D., & Long, M. B. (2009). A paradigm shift in the interaction of experiments and computations in combustion research. *Proceedings of the Combustion Institute*, *32*(1), 879-886. https://doi.org/10.1016/j.proci.2008.05.066
17. Connelly, B. C., Long, M. B., Smooke, M. D., Hall, R. J., & Colket, M. B. (2009). Computational and experimental investigation of the interaction of soot and NO in coflow diffusion flames. *Proceedings of the Combustion Institute*, *32*(1), 777-784. https://doi.org/10.1016/j.proci.2008.06.182
18. Dworkin, S. B., Cooke, J. A., Bennett, B. A. V., Connelly, B. C., Long, M. B., Smooke, M. D., ... & Colket, M. B. (2009). Distributed-memory parallel computation of a forced, time-dependent, sooting, ethylene/air coflow diffusion flame. *Combustion Theory and Modelling*, *13*(5), 795-822. https://doi.org/10.1080/13647830903159293
19. Dworkin, S. B., Schaffer, A. M., Connelly, B. C., Long, M. B., Smooke, M. D., Puccio, M. A., ... & Miller, J. H. (2009). Measurements and calculations of formaldehyde concentrations in a methane/N2/air, non-premixed flame: Implications for heat release rate. *Proceedings of the Combustion Institute*, *32*(1), 1311-1318. https://doi.org/10.1016/j.proci.2008.05.083
20. Dworkin, S. B., Connelly, B. C., Schaffer, A. M., Bennett, B. A. V., Long, M. B., Smooke, M. D., ... & Miller, J. H. (2007). Computational and experimental study of a forced, time-dependent, methane–air coflow diffusion flame. *Proceedings of the Combustion Institute*, *31*(1), 971-978. https://doi.org/10.1016/j.proci.2006.08.109

Cool Flames Investigation with Gases (CFI-G)

Includes ISS results

1. Kim, M., Waddell, K. A., Sunderland, P. B., Nayagam, V., Stocker, D. P., Dietrich, D. L., ... & Axelbaum, R. L. (2023). Spherical gas-fueled cool diffusion flames. *Proceedings of the Combustion Institute*, *39*(2), 1647-1656. https://doi.org/10.1016/j.proci.2022.07.015
2. Waddell, K. A., Lee, H. J., Nayagam, V., Axelbaum, R. L., & Sunderland, P. B. (2023). Cool diffusion flames in a stably stratified stagnation flow. *Combustion and Flame*, *254*, 112852. https://doi.org/10.1016/j.combustflame.2023.112852

Electric-Field Effects on Laminar Diffusion Flames (E-FIELD Flames)

1. Chien, Y. C., Girodon, H., & Esquivias Rodriguez, B. (2023). Modeling of Elevated Pressure Diffusion Flames with Water Addition. *Combustion Science and Technology*, *195*(7), 1666-1680. https://doi.org/10.1080/00102202.2023.2182205

Includes ISS results

2. Chien, Y. C., Stocker, D. P., Hegde, U. G., & Dunn-Rankin, D. (2022). Electric-field effects on methane coflow flames aboard the international space station (ISS): ACME E-FIELD flames. *Combustion and Flame*, *246*, 112443. https://doi.org/10.1016/j.combustflame.2022.112443
3. Escofet-Martin, D., Chien, Y. C., & Dunn-Rankin, D. (2022). PLIF and chemiluminescence in a small laminar coflow methane-air diffusion flame at elevated pressures. *Combustion and Flame*, 112067. https://doi.org/10.1016/j.combustflame.2022.112067
4. Chien, Y. C., Escofet-Martin, D., & Dunn-Rankin, D. (2019). Ion current and carbon monoxide release from an impinging methane/air coflow flame in an electric field. *Combustion and Flame*, *204*, 250-259. https://doi.org/10.1016/j.combustflame.2019.03.022
5. Tinajero, J., & Dunn-Rankin, D. (2019). Non-premixed axisymmetric flames driven by ion currents. *Combustion and Flame*, *199*, 365-376. https://doi.org/10.1016/j.combustflame.2018.10.036
6. Chien, Y. C., & Dunn-Rankin, D. (2018). Electric field induced changes of a diffusion flame and heat transfer near an impinging surface. *Energies*, *11*(5), 1235. https://doi.org/10.3390/en11051235
7. Sauer, V. M., & Dunn-Rankin, D. (2017). Impinging nonpremixed coflow methane–air flames with unity Lewis number. *Proceedings of the Combustion Institute*, *36*(1), 1411-1419. https://doi.org/10.1016/j.proci.2016.06.193
8. Tinajero, J., Bernard, G., Autef, L., & Dunn-Rankin, D. (2017). Characterizing iv curves for non-premixed methane flames stabilized on different burner configurations. *Combustion Science and Technology*, *189*(10), 1739-1750. https://doi.org/10.1080/00102202.2017.1331218
9. Chien, Y. C., Escofet-Martin, D., & Dunn-Rankin, D. (2016). CO emission from an impinging non-premixed flame. *Combustion and flame*, *174*, 16-24. https://doi.org/10.1016/j.combustflame.2016.09.004
10. Karnani, S., & Dunn-Rankin, D. (2015). Detailed characterization of DC electric field effects on small non-premixed flames. *Combustion and Flame*, *162*(7), 2865-2872. https://doi.org/10.1016/j.combustflame.2015.03.019

11. Weinberg, F. J., Dunn-Rankin, D., Carleton, F. B., Karnani, S., Markides, C., & Zhai, M. (2013). Electrical aspects of flame quenching. *Proceedings of the Combustion Institute*, *34*(2), 3295-3301. https://doi.org/10.1016/j.proci.2012.07.007
12. Borgatelli, F., & Dunn-Rankin, D. (2012). Behavior of a small diffusion flame as an electrically active component in a high-voltage circuit. *Combustion and flame*, *159*(1), 210-220. https://doi.org/10.1016/j.combustflame.2011.06.002
13. Yamashita, K., Karnani, S., & Dunn-Rankin, D. (2009). Numerical prediction of ion current from a small methane jet flame. *Combustion and Flame*, *156*(6), 1227-1233. https://doi.org/10.1016/j.combustflame.2009.02.002
14. Papac, M. J., & Dunn-Rankin, D. (2008). Modelling electric field driven convection in small combustion plasmas and surrounding gases. *Combustion Theory and Modelling*, *12*(1), 23-44. https://doi.org/10.1080/13647830701383814
15. Weinberg, F., Carleton, F., & Dunn-Rankin, D. (2008). Electric field-controlled mesoscale burners. *Combustion and Flame*, *152*(1-2), 186-193. https://doi.org/10.1016/j.combustflame.2007.07.007
16. Rickard, M., & Dunn-Rankin, D. (2007). Numerical simulation of a tubular ion-driven wind generator. *Journal of Electrostatics*, *65*(10-11), 646-654. https://doi.org/10.1016/j.elstat.2007.04.003
17. Dunn-Rankin, D., & Weinberg, F. J. (2006). Using large electric fields to control transport in microgravity. *Annals of the New York Academy of Sciences*, *1077*(1), 570-584. https://doi.org/10.1196/annals.1362.037
18. Papac, M. J., & Dunn-Rankin, D. (2006). Canceling Buoyancy of Gaseous Fuel Flames in a Gravitational Environment Using an Ion-Driven Wind. *Annals of the New York Academy of Sciences*, *1077*(1), 585-601. https://doi.org/10.1196/annals.1362.038
19. Rickard, M., Dunn-Rankin, D., Weinberg, F., & Carleton, F. (2006). Maximizing ion-driven gas flows. *Journal of Electrostatics*, *64*(6), 368-376. https://doi.org/10.1016/j.elstat.2005.09.005
20. Weinberg, F., Carleton, F., Kara, D., Xavier, A., Dunn-Rankin, D., & Rickard, M. (2006). Inducing gas flow and swirl in tubes using ionic wind from corona discharges. *Experiments in fluids*, *40*(2), 231-237. https://doi.org/10.1007/s00348-005-0062-0

Flame Design (Flame Design)

Includes ISS results

1. Frolov, S. M., Ivanov, V. S., Frolov, F. S., Vlasov, P. A., Axelbaum, R., Irace, P. H., ... & Waddell, K. (2023). Soot formation in spherical diffusion flames. *Mathematics*, *11*(2), 261. https://doi.org/10.3390/math11020261
2. Irace, P. H., Waddell, K. A., Constales, D., Kim, M., Yablonsky, G., Sunderland, P. B., & Axelbaum, R. L. (2023). On the existence of steady-state gaseous microgravity spherical diffusion flames in the presence of radiation heat loss. *Proceedings of the Combustion Institute*, *39*(2), 1721-1729. https://doi.org/10.1016/j.proci.2022.07.049
3. Irace, P. H., Waddell, K. A., Constales, D., Sunderland, P. B., & Axelbaum, R. L. (2023). Critical temperature and reactant mass flux for radiative extinction of ethylene microgravity spherical diffusion flames at 1 bar. *Proceedings of the Combustion Institute*, *39*(2), 1905-1913. https://doi.org/10.1016/j.proci.2022.07.043

4. Irace, P. H., Gopan, A., & Axelbaum, R. L. (2022). An investigation of thermal radiation from laminar diffusion flames in a tri-coflow burner with central oxygen. *Combustion and Flame*, *242*, 112158.
   https://doi.org/10.1016/j.combustflame.2022.112158

Includes ISS results

5. Irace, P. H., Lee, H. J., Waddell, K., Tan, L., Stocker, D. P., Sunderland, P. B., & Axelbaum, R. L. (2021). Observations of long duration microgravity spherical diffusion flames aboard the International Space Station. *Combustion and Flame*, *229*, 111373.
   https://doi.org/10.1016/j.combustflame.2021.02.019
6. Wang, Z., Sunderland, P. B., & Axelbaum, R. L. (2020). Double blue zones in inverse and normal laminar jet diffusion flames. *Combustion and Flame*, *211*, 253-259.
   https://doi.org/10.1016/j.combustflame.2019.09.014
7. Wang, Z., Sunderland, P. B., & Axelbaum, R. L. (2019). Dilution effects on laminar jet diffusion flame lengths. *Proceedings of the Combustion Institute*, *37*(2), 1547-1553.
   https://doi.org/10.1016/j.proci.2018.06.085
8. Wu, W., Adeosun, A., & Axelbaum, R. L. (2019). A new method of flame temperature measurement utilizing the acoustic emissions from laser-induced plasmas. *Proceedings of the Combustion Institute*, *37*(2), 1409-1415.
   https://doi.org/10.1016/j.proci.2018.07.096
9. Rodenhurst III, M. K., Chao, B. H., Sunderland, P. B., & Axelbaum, R. L. (2018). Structure and extinction of spherical burner-stabilized diffusion flames that are attached to the burner surface. *Combustion and Flame*, *187*, 22-29.
   https://doi.org/10.1016/j.combustflame.2017.08.024
10. Gopan, A., Yang, Z., Kumfer, B. M., & Axelbaum, R. L. (2017). Effects of Inert Placement (Z st) on Soot and Radiative Heat Flux in Turbulent Diffusion Flames. *Energy & Fuels*, *31*(7), 7617-7623.
    https://doi.org/10.1021/acs.energyfuels.7b01092
11. Wu, W., Yablonsky, G., & Axelbaum, R. L. (2016). Observation of water–gas shift equilibrium in diffusion flames. *Combustion and Flame*, *173*, 57-64.
    https://doi.org/10.1016/j.combustflame.2016.07.025
12. Krishnan, S., Kumfer, B. M., Wu, W., Li, J., Nehorai, A., & Axelbaum, R. L. (2015). An approach to thermocouple measurements that reduces uncertainties in high-temperature environments. *Energy & Fuels*, *29*(5), 3446-3455.
    https://doi.org/10.1021/acs.energyfuels.5b00071
13. Lecoustre, V. R., Sunderland, P. B., Chao, B. H., & Axelbaum, R. L. (2013). Modeled quenching limits of spherical hydrogen diffusion flames. *Proceedings of the Combustion Institute*, *34*(1), 887-894.
    https://doi.org/10.1016/j.proci.2012.07.029
14. Xia, F., & Axelbaum, R. L. (2013). Simplifying the complexity of diffusion flames through interpretation in C/O ratio space. *Computers & Mathematics with Applications*, *65*(10), 1625-1632.
    https://doi.org/10.1016/j.camwa.2013.01.008
15. Xia, F., Yablonsky, G. S., & Axelbaum, R. L. (2013). Numerical study of flame structure and soot inception interpreted in carbon-to-oxygen atom ratio space. *Proceedings of the Combustion Institute*, *34*(1), 1085-1091.
    https://doi.org/10.1016/j.proci.2012.06.043
16. Yi, F., & Axelbaum, R. L. (2013). Stability of spray combustion for water/alcohols mixtures in oxygen-enriched air. *Proceedings of the Combustion Institute*, *34*(1), 1697-1704.
    https://doi.org/10.1016/j.proci.2012.05.088

17. Lecoustre, V. R., Sunderland, P. B., Chao, B. H., & Axelbaum, R. L. (2012). Numerical investigation of spherical diffusion flames at their sooting limits. *Combustion and flame*, *159*(1), 194-199. https://doi.org/10.1016/j.combustflame.2011.05.022
18. Wang, Q., & Chao, B. H. (2011). Kinetic and radiative extinctions of spherical burner-stabilized diffusion flames. *Combustion and flame*, *158*(8), 1532-1541. https://doi.org/10.1016/j.combustflame.2010.12.007
19. Lecoustre, V. R., Sunderland, P. B., Chao, B. H., & Axelbaum, R. L. (2010). Extremely weak hydrogen flames. *Combustion and flame*, *157*(11), 2209-2210. https://doi.org/10.1016/j.combustflame.2010.07.024
20. Skeen, S. A., Yablonsky, G., & Axelbaum, R. L. (2010). Characteristics of non-premixed oxygen-enhanced combustion: II. Flame structure effects on soot precursor kinetics resulting in soot-free flames. *Combustion and Flame*, *157*(9), 1745-1752. https://doi.org/10.1016/j.combustflame.2010.04.013
21. Skeen, S. A., Yablonsky, G., & Axelbaum, R. L. (2009). Characteristics of non-premixed oxygen-enhanced combustion: I. The presence of appreciable oxygen at the location of maximum temperature. *Combustion and Flame*, *156*(11), 2145-2152. https://doi.org/10.1016/j.combustflame.2009.07.009
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