

# Publications Thermo-Fluid Dynamics Group

May 7, 2024

## Reviewed journal articles or conference proceedings

1. A. M. Garcia, S. Le Bras, J. Prager, I. Boxx, and W. Polifke. Impact of H<sub>2</sub>-enrichment on the response of a partially premixed CH<sub>4</sub>-air flame to velocity and equivalence ratio fluctuations. *Combustion and Flame*, 2024.
2. J. Yao and C. F. Silva. Comparison of Standard Bayesian Methods and PINNs for the Reconstruction of Acoustic Fields under External Broadband Forcing. *INTER-NOISE and NOISE-CON Congress and Conference Proceedings*, 2024.
3. P. Brokof, C. M. Douglas, and W. Polifke. The role of hydrodynamic shear in the thermoacoustic response of slit flames. *Proceedings of the Combustion Institute*, 2024.
4. A. J. Eder, B. Dharmaputra, A. M. Garcia, S. F. Camilo, and W. Polifke. Identification of entropy waves in a partially premixed combustor. *Proceedings of the Combustion Institute*, 2024.
5. C. F. Silva and W. Polifke. A new class of Galerkin expansion models for the study of thermoacoustic instabilities. *Proceedings of the Combustion Institute*, 2024.
6. P. Brokof, G. Varillon, V. Inoue, and Polifke, Wolfgang. Towards a Momentum Potential Theory for Reacting Flows. *submitted to Int. J. Spray Comb. Dynamics*, 2024.
7. G. Varillon, T. L. Kaiser, B. Philipp, K. Oberleithner, and W. Polifke. Linear analysis of a swirling jet with a realistic swirler model. *submitted to Int. J. Spray Comb. Dynamics*, 2024.
8. T. L. Kaiser, J. G. von Saldern, M. Goldack, W. Polifke, G. Varillon, F. Zhang, T. Zirwes, H. Bockhorn, and K. Oberleithner. On the significance of modeling turbulent transport when linearizing the governing equations of a turbulent Bunsen flame. *submitted to Int. J. Spray Comb. Dynamics*, 2024.
9. N. Tathawadekar, A. Ösün, A. J. Eder, C. F. Silva, and N. Thuerey. Linear and nonlinear flame response prediction of turbulent flames using neural network models. *submitted to International Journal of Spray and Combustion Dynamics*, 2024.
10. M. Désor, M. Haeringer, M. Hiestermann, K. Niebler, C. F. Silva, and W. Polifke. Application of an improved workflow for the identification of flame dynamics to swirl stabilized WET combustion. *ASME Turbo Expo 2024 Turbomachinery Technical Conference & Exposition*, London, UK, 2024.
11. A. J. Eder, M. Merk, T. Hollweck, A. Fischer, C. Lahiri, C. F. Silva, and W. Polifke. Model-based inference of flame transfer matrices from acoustic measurements in an aero-engine test rig. *ASME Turbo Expo 2024 Turbomachinery Technical Conference & Exposition*, London, UK, 2024. American Society of Mechanical Engineers.
12. G. Doehner, A. J. Eder, and C. F. Silva. A Parsimonious System of Ordinary Differential Equations for the Response Modeling of Turbulent Swirled Flames. *Combustion and Flame*, 2024.
13. P. Bonnaire and W. Polifke. Analysis of High-Frequency Dynamics of a Reacting Jet in Crossflow Based on Large Eddy Simulation. *Journal of Engineering for Gas Turbines and Power*, 146(3):031002, 2024.

14. M. Rywik, A. Zimmermann, A. J. Eder, E. Scoletta, and W. Polifke. Spatially resolved modeling of the nonlinear dynamics of a laminar premixed flame with a multilayer perceptron - convolution autoencoder network. *Journal of Engineering for Gas Turbines and Power*, 146:061009–1, 2024.
15. A. J. Eder, B. Dharmaputra, M. Désor, C. F. Silva, A. M. Garcia, B. Schuermans, N. Noiray, and W. Polifke. Generation of Entropy Waves by Fully Premixed Flames in a Non-Adiabatic Combustor with Hydrogen Enrichment. *Journal of Engineering for Gas Turbines and Power*, 145(11):111001, 2023.
16. M. Merk, A. J. Eder, and W. Polifke. An Arbitrary Lagrangian-Eulerian framework for the consistent analysis of entropy wave generation. *Combustion and Flame*, 262:113334, Apr. 2024.
17. N. N. Tathawadekar, N. A. K. Doan, C. F. Silva, and N. Thuerey. Incomplete to complete multiphysics forecasting: A hybrid approach for learning unknown phenomena. *Data-Centric Engineering*, 4:e27, 2023.
18. M. Hiestermann, M. Haeringer, M. Désor, and W. Polifke. Comparison of non-premixed and premixed flamelets for ultra WET Aero Engine Combustion Conditions. *GPPS23*, (GPPS-TC-2023-0277):18, 2023.
19. C. M. Douglas, W. Polifke, and L. Lesshafft. Flash-back, blow-off, and symmetry breaking of premixed conical flames. *Comb. & Flame*, 2023.
20. T. L. Kaiser, G. Varillon, W. Polifke, F. Zhang, T. Zirwes, H. Bockhorn, and K. Oberleithner. Modelling the response of a turbulent jet flame to acoustic forcing in a linearized framework using an active flame approach. *Combust. Flame*, 253(7):112778, 2023.
21. G. Varillon, P. Brokof, and W. Polifke. Global Linear Stability Analysis of a Slit Flame Subject to Intrinsic Thermoacoustic Instability. *Proceedings of the 29th International Congress on Sound and Vibration*. Society of Acoustics, Prague, CZ, Sept. 2023.
22. N. Purwar and W. Polifke. Preserving Transfer-behavior in Model Order Reduction for Thermoacoustic Stability Analysis. *J. Sound and Vibration*, 565(2):117862, 2023.
23. P. Bonnaire and W. Polifke. Analysis of High-Frequency Dynamics of a Reacting Jet in Crossflow Based on Large Eddy Simulation. *Volume 3B: Combustion, Fuels, and Emissions*, page V03BT04A010, Boston, Massachusetts, USA, June 2023. American Society of Mechanical Engineers.
24. M. Rywik, A. Zimmermann, A. J. Eder, E. Scoletta, and W. Polifke. Spatially resolved modeling of the nonlinear dynamics of a laminar premixed flame with a multilayer perceptron - convolution autoencoder network. *ASME Turbo Expo 2023 Turbomachinery Technical Conference & Exposition*, GT2023-102543, Boston, MA, USA, 2023.
25. A. J. Eder, B. Dharmaputra, M. Désor, C. F. Silva, A. M. Garcia, B. Schuermans, N. Noiray, and W. Polifke. Generation of entropy waves by fully premixed flames in a non-adiabatic combustor with hydrogen enrichment. *ASME Turbo Expo 2023 Turbomachinery Technical Conference & Exposition*, volume Volume 3B: Combustion, Fuels, and Emissions, page V03BT04A009, Boston, MA, USA, 2023. American Society of Mechanical Engineers.
26. K. J. Yong, C. F. Silva, G. J. J. Fournier, and W. Polifke. Categorization of thermoacoustic modes in an ideal resonator with phasor diagrams. *Combustion and Flame*, 249:112605, Mar. 2023.

27. A. M. Garcia, S. Le Bras, and W. Polifke. Effect of hydrogen addition on the consumption speed of lean premixed laminar methane flames exposed to combined strain and heat loss. *Combustion Theory and Modelling*, 27(4):584–604, 2023.
28. C. F. Silva. Intrinsic thermoacoustic instabilities. *Progress in Energy and Combustion Science*, 95:101065, Mar. 2023.
29. A. J. Eder, C. F. Silva, M. Haeringer, J. Kuhlmann, and W. Polifke. Incompressible versus compressible large eddy simulation for the identification of premixed flame dynamics. *International Journal of Spray and Combustion Dynamics*, 15(1):16–32, 2023.
30. G. J. J. Fournier, F. Schaefer, M. Haeringer, C. F. Silva, and W. Polifke. Interplay of Clusters of Acoustic and Intrinsic Thermoacoustic Modes in Can-Annular Combustors. *Journal of Engineering for Gas Turbines and Power*, 144(12):121015, Dec. 2022.
31. M. Merk, P. E. Buschmann, J. P. Moeck, and W. Polifke. The Nonlinear Thermoacoustic Eigenvalue Problem and Its Rational Approximations: Assessment of Solution Strategies. *Journal of Engineering for Gas Turbines and Power*, 145(2):021028, Feb. 2023.
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40. G. Doehner, M. Haeringer, and C. F. Silva. Nonlinear flame response modelling by a parsimonious set of ordinary differential equations. *International Journal of Spray and Combustion Dynamics*, 14(1-2):17–29, May 2022.

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