

Publications

Thesis

- [1] M. Klein. *Towards LES as an Engineering Tool*, Habilitation, Technische Universität Darmstadt. 2009.
- [2] M. Klein. *Direkte Numerische Simulation des primären Strahlzerfalls in Einstoffzerstäuberdüsen*. PhD thesis, Technische Universität Darmstadt, 2002.

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- [3] V. Papapostolou, N. Chakraborty, M. Klein, and H. G. Im. Statistics of scalar flux transport of major species in different premixed turbulent combustion regimes for H₂-air flames. *Flow Turbulence and Combustion*, 2018, accepted.
- [4] K. Amend and M. Klein. Development and validation of a CFD wash-off model for fission products on containment walls. *International Journal for Nuclear Power*, 63:469–473, 2018.
- [5] U. Ahmed, N. Doan, J. Lai, M. Klein, N. Chakraborty, and N. Swaminathan. Multiscale analysis of head-on quenching premixed turbulent flames. *Physics of Fluids*, 2018, accepted.
- [6] Vassilios Papapostolou, Nilanjan Chakraborty, Markus Klein, and Hong G. Im. Effects of reaction progress variable definition on the flame surface density transport statistics and closure for different combustion regimes. *Combustion Science and Technology*, 2018, accepted.
- [7] J. Hasslberger, M. Klein, and Nilanjan Chakraborty. Flow topologies in bubble-induced turbulence: A direct numerical simulation analysis. *Journal of Fluid Mechanics*, 2018, accepted.
- [8] G. Ozel Erol, J. Hasslberger, M. Klein, and Nilanjan Chakraborty. A direct numerical simulation analysis of spherically expanding turbulent flames in fuel droplet-mists for an overall equivalence ratio of unity. *Physics of Fluids*, 2018, accepted.
- [9] M. Schoepplein, J. Weatheritt, R. Sandberg, M. Talei, and M. Klein. Application of an evolutionary algorithm to LES modeling of turbulent transport in premixed flames. *Journal of Computational Physics*, 2018, accepted.
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- [11] M. Klein, H. Nachtigal, M. Hansinger, M. Pfitzner, and N. Chakraborty. Flame curvature distribution in high pressure turbulent Bunsen premixed flames. *Flow Turbulence and Combustion*, 2018.
- [12] N. Chakraborty, D.H. Wacks, S. Ketterl, M. Klein, and H.G. Im. Scalar dissipation rate transport conditional on flow topologies in different regimes of premixed turbulent combustion. *Proc. Comb. Inst.*, 37, 2019.
- [13] N. Chakraborty, M. Klein, D. Alwazzan, and H.G. Im. Surface density function statistics in hydrogen-air flames for different turbulent premixed combustion regimes. *Combustion Science and Technology*, 2018.

- [14] M. Klein, C. Kasten, N. Chakraborty, N. Mukhadiyev, and H.G. Im. Turbulent scalar fluxes in H_2 -air premixed flames at low and high Karlovitz numbers. *Combustion Theory and Modelling*, 2018, accepted.
- [15] J. Lai, M. Klein, and N. Chakraborty. Direct numerical simulation of head-on quenching of statistically planar turbulent premixed methane-air flames using a detailed chemical mechanism. *Flow Turbulence and Combustion*, 2018, accepted.
- [16] M. Klein and N. Chakraborty. A-priori analysis of an alternative wrinkling factor definition for flame surface density based large eddy simulation modelling of turbulent premixed combustion. *Combustion Science and Technology*, 2018, accepted.
- [17] M. Klein, D. Alwazzan, and N. Chakraborty. A direct numerical simulation analysis of pressure variation in turbulent premixed bunsen burner flames-part 1: Scalar gradient and strain rate statistics. *Computers and Fluids*, 2018, accepted.
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Invited Talks

- [160] M. Klein. Mathematische und physikalische Modellierung von turbulenten Zweiphasenströmungen. ITLR, University Stuttgart, March 2018.
- [161] M. Klein. Towards LES for two phase flows. Helmholtz-Zentrum Dresden-Rossendorf, July 2017.
- [162] M. Klein. Recent experiences with modelling of turbulence chemistry interaction in the context of LES using DNS of turbulent premixed generic planar flame configurations. Annual meeting of the UK Consortium on Turbulent Reacting Flows, September 2016.
- [163] M. Klein. Analysis of the combined modelling of subgrid transport and filtered flame propagation for premixed turbulent combustion. University of Duisburg, January 2015.
- [164] M. Klein. An attempt to assess the quality of les in the context of implicit filtering. University of Newcastle, November 2013.
- [165] M. Klein. Industrial cfd: Applications and challenges. Technical University of Munich, February 2013.
- [166] M. Klein. 3D CFD base engine development. University of Applied Science, Darmstadt, December 2010.
- [167] M. Klein. 3D CFD base engine development. University of Applied Science, Darmstadt, December 2009.
- [168] M. Klein. 3D CFD base engine development. University of Applied Science, Darmstadt, January 2008.
- [169] M. Klein. LES quality assessment. In *8th Workshop on Turbulent Nonpremixed Flames*, Heidelberg, August 2006.
- [170] M. Klein. Quality assessment of LES in the context of implicit filtering. In *Quality Assessment of Unsteady Methods for Turbulent Combustion Prediction and Validation*, Darmstadt, June 2005.
- [171] M. Klein. Numerical and experimental characterization of the turbulence structure in swirled flows. Cambridge University, November 2004.
- [172] M. Klein. How LES can be made an engineering tool. Cambridge University, July 2004.
- [173] M. Klein. Direkte numerische Simulation von ebenen ein- und zweiphasigen Freistrahlen. University of Zurich, Mai 2003.
- [174] M. Klein. On the artificial generation of inlet and initial data for unsteady turbulent flow simulation. In *17. TECFLAM-Seminar*, Stuttgart, Dezember 2003.