

COMBUSTION WEBINAR

Chemometric approaches for evaluating spectra from combustion environments

Speaker: Johannes Kiefer, University of Bremen, Germany

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Biography: Johannes is currently chair professor of engineering thermodynamics and dean of the faculty of production engineering at the University of Bremen, Germany. He graduated with a degree in chemical engineering at the University of Erlangen-Nuremberg in 2005 and earned a PhD from the same institution in 2008. From 2010 to 2014 he was a lecturer and senior lecturer at the University of Aberdeen, Scotland before he moved to Bremen in 2014. Johannes was a research fellow and visiting researcher at Lund University, Sweden and at the Combustion Research Facility of the Sandia National Labs in Livermore/CA. His research includes the development and application of optical diagnostics of fuels, sprays, and reactive flows. He received a number of prizes, for example, the Hinshelwood Prize of the British Section of the Combustion Institute and the Distinguished Paper Award on Diagnostics of the 2010 International Symposium on Combustion.

Abstract: Combustion related environments are typically highly complex with respect to their physics and chemistry. Spectroscopic methods have therefore a great potential to characterize such systems as the data are affected by the physical and chemical state of the sample. Retrieving useful information from complex spectra calls for sophisticated techniques for processing and evaluating the data. The chemometrics toolbox offers a multitude of suitable methods for this purpose. The webinar will introduce various multivariate approaches and their application to spectroscopic data (e.g. Raman, IR, LIBS) from fuels, sprays, and flames. It is shown that they provide new ways of looking at data and developing unsupervised procedures for data evaluation.

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