学术报告：基于吸收光谱和发射光谱的三维以及四维燃烧诊断
报告人：马林 博士
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Multidimensional Combustion Diagnostics Based on Absorption and Emission Tomography

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EDUCATION EXPERIENCE
Ph.D., Stanford University, 2006, Mechanical Engineering
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Virginia Tech, 2011 – present, Associate Professor
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Lin Ma is an Associate Fellow of the AIAA, and member of the OSA and SAE. He was a recipient of the NSF CAREER award (2009) for his project entitled "Resolving Turbulence-Chemistry Interaction Using Novel Laser Diagnostics".

Research Topics:

Tomographic imaging based on hyperspectral spectroscopy

This research seeks to significantly enhance the performance of tomography techniques using hyperspectral absorption spectroscopy. Traditional tomography techniques usually use a few wavelengths, which results in cumbersome experimental requirements and limited measurement capability. This research exploits the spectral information content enabled by hyperspectral lasers to reduce experimental complexity, improve imaging accuracy, and enable simultaneous monitoring of multiple properties (e.g., concentration and temperature).

Multidimensional tomographic diagnostics

This research aims at obtaining three-dimensional (3D) imaging measurements in turbulent flames at kHz rate based on tomographic chemiluminescence (TC). Such measurement capability has been long desired to resolve the inherent 3D spatial structures and temporal dynamics of turbulent flames. In this work, five high speed cameras were employed to simultaneously record projection measurements of chemiluminescence emissions of turbulent jet flames from five different view angles 1 and 2 kHz. These projection measurements were then used as the inputs for a tomography inversion algorithm to yield the 3D instantaneous spatial structures of the flames in a measurement region of ~10×10×10 cm.