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System and method for spatially and temporally resolved measurements of gas temperature

A fast, reliable, and accurate method utilizing optical emission spectroscopy and a nanosecond plasma pulse allows for precise, non-invasive gas temperature measurement for applications like fuel combustion and propulsion.

Researchers at Purdue University have developed a new method for measuring gas temperature within 5 nanoseconds. The technique features optical emission spectroscopy (OES) in conjunction with a probing nanosecond plasma pulse to measure bulk gas temperature with great spatial and temporal resolution. Purdue researchers have demonstrated that it is physically feasible to establish pulsing probe parameters so that gas heating by the probing pulse itself is negligible, whereas the emission from the probing plasma is sufficient to conduct the OES measurements and conduct the temperature measurement.

Advantages:

-Fast

-Reliable

-Accurate

Potential Applications:

-Fuel combustion

-Propulsion

TRL: 6

Intellectual Property:

Technology ID
2020-SHAS-68898

Category
Aerospace & Defense/Hypersonics & Propulsion Systems
Aerospace & Defense/Thermal Management & Combustion Optimization
Automotive & Mobility Tech/Fuel Injection & Combustion Control Systems

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