

Poster Session (P)

Poster Lunch (1)

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MULTISPECIES COMBUSTION DIAGNOSTICS OF CO AND NO USING MIDINFRARED ABSORPTION SPECTROSCOPY

Abstract

Green space propulsion is perceived as a focus on the space propulsion research worldwide, in which ADN monopropellant with high-energetic and non-toxic characteristics become a significant object for the next generation of green monopropellant. Quantitative experiments are made to measure the concentration of the key intermediate products and the temperature of combustion gas flow when the thruster operates, essentially improving understanding of the combustion process with decomposition and combustion for the ADN monopropellant. An in situ combustion diagnostic system based on mid-infrared quantum cascade laser absorption spectroscopy (QCLAS) is developed to measure selected key combustion species of CO and NO in the decomposition and combustion process for ADN based thruster. The diagnostics of microscopic parameters can guide the ADN based thruster development such as optimizing thruster design and assessing combustion stability and the overall performance of the thruster.