

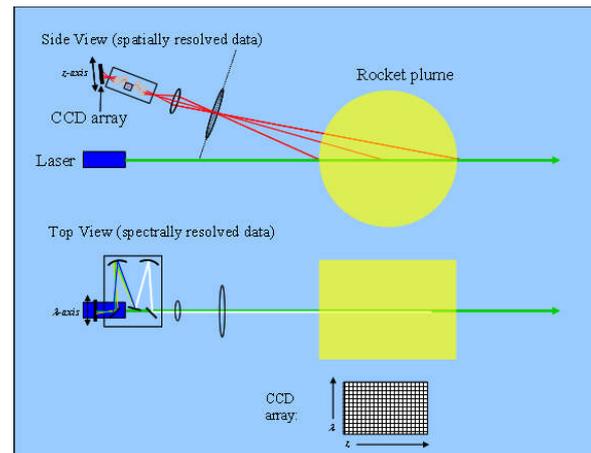
Laser-Induced Emissions Sensor for Soot Mass in Rocket Plumes

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Identification and Significance of Innovation

A method is proposed to measure soot mass concentration non-intrusively from a distance in a rocket engine exhaust stream during ground tests using laser-induced incandescence (LII).



Technical Objectives and Work Plan

Objective: To demonstrate the feasibility of (1) quantitative soot mass with LII at rocket plume temperatures, and (2) sufficient vibration isolation to allow laser measurements.

#	Task Description	Month					
		1	2	3	4	5	6
1	Kickoff Meeting	—					
2	Build Phase I Breadboard System	—	—				
3	Determine Temperature Dependence on LII			—	—		
4	Evaluate Feasibility for Rocket Plumes				—		
5	Estimate System Performance					—	
6	Phase II Work Plan and Cost Evaluation					—	
7	Reporting			—			—

NASA and Non-NASA Applications

NASA heavy lift space transportation systems using hydrocarbon fuels.

- Project Constellation – Return to moon by 2020 Exploration.
- Systems Research and Technology – Beyond LEO.

Commercial markets include those that monitor particle effluents from industrial processes.

- Stack monitors.
- Testing diesel automobiles and trucks.

Firm Contacts

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