

# **SERDP PROJECT OF THE YEAR WEAPONS SYSTEMS & PLATFORMS**

## **COMBUSTION SCIENCE TO REDUCE PARTICULATE MATTER EMISSIONS FOR MILITARY PLATFORMS**

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**D**oD is one of the largest operators of aircraft in the world. Gas turbine engines are a major source of particulate matter emissions; a substantial fraction of these emissions consist of soot particles with diameters of less than 2.5 microns (PM<sub>2.5</sub>). Although technology advancements have reduced soot emissions, additional reductions will be needed to meet future PM<sub>2.5</sub> National Ambient Air Quality Standards (NAAQS). The long-term solution is to build engines of the future in a way that reduces their emissions—a daunting challenge given the complexity involved.

Dr. Mel Roquemore led a collaborative team from academia, industry, and government laboratories in advancing the fundamental science relevant to the formation of PM<sub>2.5</sub>. The team conducted experiments and simulations to understand the chemistry, fluid dynamics, and thermodynamics of particle formation in high-performance engines. Accurate soot and fuel models were developed that can be used in designing low soot emission combustors.

This groundbreaking research will enable jet engine manufacturers to design and build engines that emit less pollution, protecting the health of military personnel and surrounding communities.

*For more specific information about this project, stop by Poster #46.*