



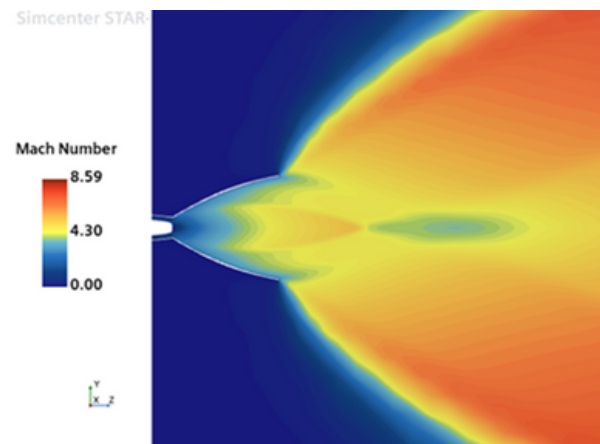
FOR IMMEDIATE RELEASE

NASA AWARDS PHASE II SBIR CONTRACT FOR RDRE NOZZLE OPTIMIZATION

Huntsville, Ala., Aug. 18, 2025 -- Quadrus Corporation was awarded a NASA Phase II Small Business Innovation Research (SBIR) contract to advance the design and optimization of high area ratio nozzles for Rotating Detonation Rocket Engines (RDREs).

The contract, which was awarded on July 3, is a two-year, \$850,000 effort that will build on Quadrus Corporation's successful Phase I work. The research will deepen the understanding of how detonation-driven flow fields influence supersonic nozzle expansion, particularly in upper-stage and in-space propulsion systems with area ratios greater than 100.

In Phase I, Quadrus Corporation developed a novel simulation-based framework to explore RDRE nozzle behavior, which revealed how rotating detonation waves can alter classical gas dynamics. Phase II will now shift focus to experimental validation by collecting pressure data from a series of RDRE test configurations and comparing those results with advanced CFD simulations. The baseline design leverages a subscale RDRE recently tested by engineers at NASA Marshall Space Flight Center, ensuring continuity with prior lessons learned and grounding the study in real-world hardware performance.



above: an example of typical RDRE nozzle simulation results

"This work addresses one of the key unknowns in making RDREs truly viable for high-efficiency space propulsion. High area ratio nozzles are essential for in-space performance, but no one has definitively mapped how detonation-based flow interacts with traditional nozzle theory at these scales. Our approach – grounded in data, validated simulations, and collaboration with some of the best minds in propulsion – will help close that gap." -Dr. Joe Sims, Director of Advanced Manufacturing at Quadrus Corporation

Quadrus Corporation is proud to partner with Aerojet Rocketdyne (an L3Harris company) and the University of Alabama in Huntsville on this research effort, combining industry expertise, academic insight, and advanced manufacturing capabilities to support NASA's goals for next-generation propulsion systems.

ABOUT QUADRUS CORPORATION:

Quadrus Corporation is a leading provider of commercial software solutions, contract engineering services, integration, and advanced manufacturing techniques based in Huntsville, Ala.

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