MUREP Small Business Technology Transfer (M-STTR) Planning Grants

Title: High-Performance Rotating Detonation Rocket Engine
Institution: University of Central Florida
City/State: Orlando, FL
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SUMMARY:
Under this project, we will develop key technology needed for a viable rotating detonation rocket engine. This innovative rocket cycle has the potential to dramatically improve the performance and lower the cost of rocket engines, and consequently, the price of launch services. The federal government is the largest user of launch services in the world. Federal agencies such as DoD, NASA, the National Reconnaissance Office (NRO), and the National Oceanic and Atmospheric Administration (NOAA) rely on satellites for many of their core capabilities. Therefore, agencies will see significant cost savings of our lower cost, high performance RDREs.

The initial target for our engine is a replacement for the RL10 engine. Variants of this engine are used by a variety of current and future planned launchers, including the Atlas V, ULA Vulcan, and Orbital ATK OmegA. This demonstrates that there is a large market for high performance LOX-hydrogen engines in this thrust class.

There is a thriving market for commercial launch services and satellites. The initial customer for our engine is likely to be a launch vehicle manufacturer such as ULA, Orbital ATK, or SpaceX. The launch vehicle manufacturer would design an upgraded version of an existing or a new launch vehicle, to utilize the performance advantages offered by our engine. Lower cost space launch will enable new commercial markets such as widespread satellite based high-speed internet services.