

MULTI-MODE NANOTHERMITE THRUSTERS WITH TUNABLE IMPULSE

Microthrusters have applications in projectile guidance systems, and micro-nano-satellite control. Thrusters are an integral part of a guidance system that includes orientation and trajectory sensors and target recognition components. The thrusters provide the actuation force to move the projectile. Nanothermite composites containing metallic fuel and inorganic oxidizer have unique combustion properties that make them potentially useful for microthruster applications. The nanothermite formulation can be tuned to achieve specific impulse characteristics. Depending on the application of the thruster, nanothermite formulation and motor design can be chosen to meet the application requirements. If properly configured, the reaction can have a velocity of <3mm/s or >1000m/s. The efficiency of the thrusters is not drastically affected by the duration of reaction.

POTENTIAL AREAS OF APPLICATIONS:

- Projectile guidance
- Micro/Nano Satellite Guidance
- Micro-Robot Actuation

PATENT STATUS: Prototype tested and non-provisional application filed

INVENTOR(S): Shubhra Gangopadhyay, Ph.D.; Steven Apperson, Ph.D.; Keshab Gangopadhyay, Ph.D.; Rajagopalan Thiruvengadathan, Ph.D.; Andrey Bezmelnitsyn, Ph.D.

CONTACT INFO: Wayne McDaniel, Ph.D.; McDanielWC@missouri.edu ; 573-884-3302