20mN VARIABLE SPECIFIC IMPULSE COLLOID THRUSTER

Busek Co. Inc.

Nathaniel Demmons, Proposal No. S3.04-8878

OBJECTIVES
- Produce electrospay thruster prototype capable of operating at 20mN thrust
- Analyze life-limiting mechanisms, and determine mitigation techniques
- Improve upon existing emitter fabrication process
- Develop new techniques for producing electrospay emitters using easily acquired porous metals

ACCOMPLISHMENTS

NOTABLE DELIVERABLES PROVIDED
- Developed and tested the largest, highest power electrospay thruster produced to date
- Developed and tested a flow controlled monolithic electrospay thruster using fiber metal media
- Devised a method to produce electrospay emitters from commercial off the shelf porous metal sheets

KEY MILESTONES MET
- Successfully tested full-scale electrospay thruster
- Material selection successfully mitigated electrochemical degradation
- Performed active flow control electrospay testing of fiber metal media thruster

FUTURE PLANNED DEVELOPMENTS

PLANNED POST-PHASE II PARTNERS  

PLANNED/POSSIBLE MISSION INFUSION
- Saturn Rings Observer
  - Missions with multiple operating regimes, particularly those requiring high thrust-to-power propulsion systems

PLANNED/POSSIBLE COMMERCIALIZATION
This or similar systems can be scaled to suit a variety of mission profiles, including attitude control and primary propulsion for satellites of various life spans. These systems are of particular interest to missions with strict power budgets.

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