NASA SBIR 2004 Phase I Solicitation

E2.04 Onboard Propulsion

Lead Center: GRC

Participating Center(s): GSFC, JSC, MSFC

This subtopic seeks technologies that will significantly increase capabilities and reduce costs for Earth science spacecraft. Propulsion functions include orbit insertion, orbit maintenance, constellation maintenance, precision positioning, in-space maneuvering, and de-orbit. Propulsion technologies are sought that will provide platforms with larger scientific payloads, longer-life missions, and increased operational flexibility during missions. To accomplish these goals, innovations are needed in low-thrust chemical and low-power electric propulsion technology, including thruster components, advanced propellants, power processing units, and feed system components. Of particular interest are innovations in propulsion technology that lead to smaller-sized, integrated, autonomous spacecraft. The following specific areas are of interest:

Miniature and Precision Propulsion

Propulsion technologies for miniature (less than 10 kg) spacecraft and for high-precision (impulse bit

Thruster Technology

Electric and chemical propulsion technologies that provide increased capability (mass and volume) and/or flexibility (duty cycle and life) for small, power-limited spacecraft, including:

- Electrostatic and electromagnetic propulsion technologies;
- High-performance (specific impulse > 250 s), high-density monopropellant thruster technology;
- High-performance (specific impulse > 350 s), space storable bipropellant thruster technology; and
- Propellant gelation technology.

Propulsion System Components

Innovative electric and chemical propulsion system components for small spacecraft are sought including:
- Materials compatible with high-temperature, oxidizing, and reactive environments;
- Components for fluid isolation, pressure and mass flow regulation, relief quick disconnect, and flow control;
- Technologies for metering, injection, and ignition of fluids in combustion devices;
- Gaseous storage and pressurization system; and
- Components for xenon storage and flow control.