Multi-Use Non-Intrusive Flow Characterization System (FCS)

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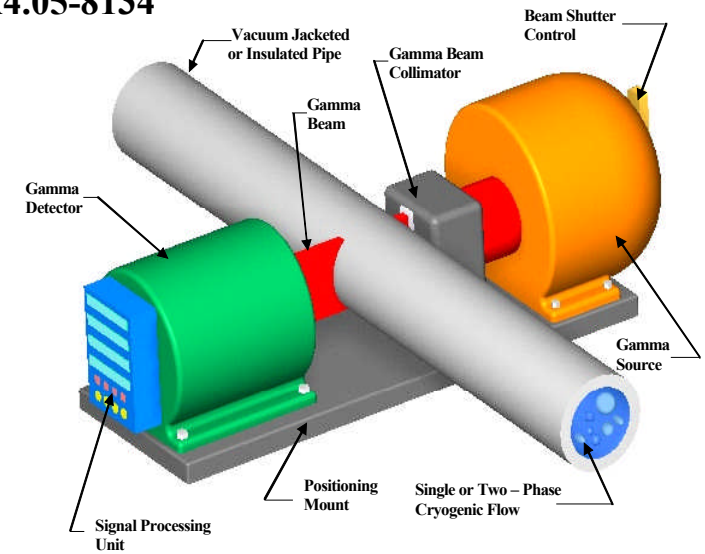
Description and Objectives

The product of the Phase II effort will be a Multi-Use Non-Intrusive Flow Characterization System (FCS) for densified, normal boiling point, and two-phase cryogenic flows, capable of accurately measuring several fluid parameters in real-time. FCS handles both transient and steady state flows, and can operate in the following five modes: (1) on-line analysis of fluid mixtures; (2) mass flow rate measurement; (3) temperature measurement; (4) fluid conditioning and health monitoring; and (5) model validation for a cryogenic or non-cryogenic fluid flow. FCS will significantly support the new exploration initiative through these application areas.



Approach

The Phase II program will draw on the successful results of the Phase I work and develop a multi-use product that has broad application throughout NASA and the rest of the aerospace community. A fully functional FCS system will be designed, fabricated, run through rigorous verification testing, and delivered to NASA/SSC upon completion of the program for use in the E1 or other facility.

Subcontractors/Partners

No outside consultants or subcontracts are planned for the Phase II effort.

Schedule and Deliverables

- The proposed program duration is 24 months long
- An FCS system capable of operating in all five application modes and providing real-time measurements will be delivered to NASA/SSC upon completion of the project.

NASA & Commercial Applications

There is a large market for an accurate, non-intrusive cryogenic flow sensor capable of handling a wide variety of flows and installations. Commercial aerospace companies and DoD have similar FCS applications requirements to NASA, including: ground-based flow metering and control, fluid conditioning and health monitoring, analytical model validation, applied fluid physics and microgravity research, in-space cryogenic fluid management and in-space mass quantity gauging.