NASA SBIR 2006 Phase I Solicitation

A1.04 Aircraft Icing Avoidance and Tolerance

Lead Center: GRC

Participating Center(s): ARC

NASA is concerned with preventing encounters with hazardous in-flight conditions and the mitigation of their effects when they do occur. To maximize the level of safety, aircraft must be capable of handling all possible icing conditions by either avoiding or tolerating the conditions. Proposals are invited that lead to innovative new approaches or significant improvements in existing technologies for in-flight icing conditions avoidance (icing weather information systems) or tolerance (airframe and engine ice protection systems and design tools). With these emphases in mind, products and technologies that can be made affordable and retrofitable within the current aviation system, as well as for use in the future are sought:

- Ground and airborne radome technologies for microwave wavelength radar and radiometers that remain clear of liquid water and ice in all weather situations.
- In situ icing environment measurement systems that can provide practical, very low-cost validation data for emerging icing weather information systems and atmospheric modeling. Measured information must include location, altitude, cloud liquid water content, temperature, and cloud particle sizing and phase information. Solutions envisioned would use radiosonde-based systems.
- Ice protection and detection technology submittal must provide significant improvements over current systems or address new design needs. Areas of improvement can be considered to be: efficient thermal protection systems, including composite wing or structures applications; ice sensors that provide detection and accretion rate for all possible icing conditions; wide area ice detection; detection that serves both ground and in-flight applications; ice crystal detection probe (for non-research aircraft applications); engine icing probe (that can measure Liquid Water Content and Total Water Content inside engine passages); and de-icing systems that operate at near anti-icing performance. Any submittal must be cost competitive to current technologies.