NASA SBIR 2007 Phase I Solicitation

A1.03  Aviation External Hazard Sensor Technologies

Lead Center: LaRC

Participating Center(s): ARC, GRC

NASA is concerned with new and innovative methods for airborne detection, identification, and evaluation of in-flight hazards to aviation. These hazards may include weather and other atmospheric phenomena, terrain, traffic, and runway contamination. Examples of hazards include: icing conditions, convective weather, wind shear, wind gusts, turbulence, volcanic ash, hail, low visibility, wake vortices, lightning, terrain, air traffic, runway incursions, man-made obstacles, and wet/icy runways. Proposals are invited that lead to innovative new technologies and approaches or significant improvements in existing technologies for in-flight hazard avoidance.

Technologies may take the form of tools, models, techniques, procedures, substantiated guidelines, prototypes, and devices. Although the emphasis is on airborne hazard detection, prediction, and avoidance, the following are also of interest: the sharing of information to support hazard avoidance by other aircraft; multi-sensor and multi-source hazard information utilization; collaborative decision-making; updates to terrain/obstacle databases; and provision of observations for input to weather models and forecast/now-cast products. Examples include:

- New and improved airborne forward-looking sensor systems;
- Data fusion technologies for integrating disparate sources of flight-related information with on-board and off-board sensor data to detect and evaluate aviation hazards;
- Innovative technologies and methods to detect, predict, and quantify hazards in order to provide accurate information and guidance to enable avoidance of hazards or to instigate strategies for mitigation; and
- Decision-support tools and methods to improve collaborative and distributive decision-making.

While this subtopic is focused on remote detection and avoidance of hazards, the same systems that provide for avoidance can be utilized for mitigation and escape. Proposals that explore these applications in addition to avoidance are welcome.