



## **NASA SBIR 2009 Phase I Solicitation**

### **A1.08 Engine Lifting and Prognosis for In-Flight Emergencies**

**Lead Center: GRC**

The object of this research topic is to develop innovative methodologies and tools to determine the consumed life of an engine and the probability of an engine system failure for future operations.

Aircraft engine design and life are based on a theoretical operation flight profile that in practice is not seen by most engines in service. The ability to predict remaining engine life with a defined reliability in real time from sensor measurements is a condition precedent to emergency operation risk assessment. It is expected that this research will result in a demonstration of an integrated life monitoring and prognosis methodology that will utilize existing and under-development probabilistic codes for engine life usage and risk assessment for future operations that may require enhanced performance.

The expected outcome of the research will be an on-line simulation demonstration of an integrated engine life module for:

- Probabilistic engine life usage calculation.
- Methodologies for engine failure prediction for future operations.
- Risk assessment and trade-off tools for off-nominal operations.

NASA resources available for the research will be an engine component data base for turbine disks and blades, and probabilistic computer codes for life prediction and reliability.

