



## NASA SBIR 2016 Phase I Solicitation

### S1.07 Airborne Measurement Systems

Lead Center: GSFC

Participating Center(s): ARC, GRC, JPL, KSC, LaRC, MSFC, SSC

Measurement system miniaturization and/or increased performance is needed to support for NASA's airborne science missions, particularly those utilizing the Global Hawk, SIERRA-class, Dragon Eye or other unmanned aircraft. The subject airborne instruments are intended as calibration/validation systems for space-based measurements, or to provide local measurements not available from space-based instruments. Linkages to other subtopics such as S3.04 Unmanned Aircraft and Sounding Rocket Technologies are encouraged. Complete instrument systems are desired, including features such as remote/unattended operation and data acquisition, low power consumption, and minimum size and weight. Desired sensors include:

- High accuracy and precision atmospheric measurements of Nitrous Oxide, Ammonia, Sulfur Dioxide, Dimethyl Sulfide, Carbonyl Sulfide and Formaldehyde, with significant improvements over the current state-of-the-art, such as measurement speed, resolution, or system weight/volume.
- Preconcentration instruments for the measurement of the isotopic composition of atmospherically relevant trace gases (CO<sub>2</sub>, CH<sub>4</sub>, O<sub>3</sub>, Ozone depleting substances and isotopomer, etc.) in are using optical, mass-spectrometric, and other types of detection. Proposals are invited for the development of versatile preconcentration instrumentation that initially can be used with a range of measurement instrumentation as well as for field and laboratory applications.
- Spectrally resolved absorption and extinction of atmospheric aerosols (0.1 to 10 micron).
- Multiphase Precipitation (0.1 mm to 20 mm with 5 % accuracy in three dimensions).
- Size distribution, phase, and asymmetry of atmospheric aerosols and cloud particles (0.1 micron to 200 micron with 10% accuracy).
- Three-dimensional wind measurement (1 mps accuracy/resolution at 10 Hz sampling).