

NASA SBIR/STTR Technologies

Next Generation, UAV-class Ozone Photometer

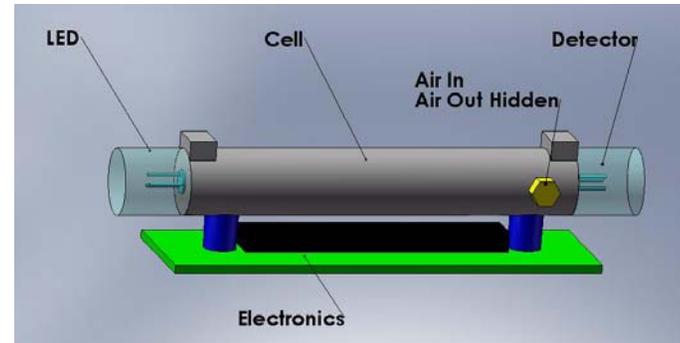


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Identification and Significance of Innovation

- Combine newly available UV light emitting diodes (LEDs) with miniaturized, sensitive, signal detection electronics to create a next generation, UAV class, absorption-based photometer for O₃.
- This architecture improves system ruggedness and reliability, and decreases system calibration, maintenance and footprint relative to currently available technology.
- This LED architecture can be extended to sensing other important species by using newly available mid-IR LEDs.

Expected TRL Range at the end of Contract (1-9): PI 4, PII 6



Phase II Prototype concept model; scale dimension is 15 cm cell length

Technical Objectives and Work Plan

- Demonstrate that a UV LED-based photometer has the requisite performance for *in situ* measurement of ambient O₃ from UAVs.
- Show that it can be packaged for deployment on a variety of NASA's UAVs.

Task 1 – Integrate the major components into a breadboard UV LED O₃ photometer.

Task 2 – Characterize the performance of the breadboard sensor.

Task 3 – Create a detailed conceptual design for a Phase II prototype O₃ sensor for deployment on UAVs and identify a field demonstration opportunity.

NASA Applications

- New *in situ* instruments for use on radiosondes, dropsondes, tethered balloons, kites, UAVs, USVs, UUVs.
- Atmospheric measurements of chemical composition including carbon dioxide, methane, reactive gases, radicals & dynamical tracers
- Instruments to support a variety of field studies including satellite measurement calibration and validation.

Non-NASA Applications

- total hydrocarbon sensor for environmental and process control
- biomedical diagnostics (breath analysis, operating room monitoring)
- home or mobile toxic gas alarms
- smart HVAC control

Firm Contacts

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NON-PROPRIETARY DATA