A NOVEL APPROACH FOR SATELITE CALIBRATION USING AN UNMANNED STRATOSPHERIC GLIDER

Prepared for the 2020 EGU General Assembly
Stratodynamics Aviation Inc. is an Earth Observation platform and service provider that’s pioneered a new cost-effective method of remote access the stratosphere. The customizable platform called the HiDRON has successfully launched and returned scientific instruments to over 100,000 feet altitude using balloon launched, autonomous technology.

We’ve identified opportunities to calibrate instruments by flying proxy beam/pulse emitters at stratospheric altitudes. As well, we see meaningful advantages to an Aircore integrated system that can sample high altitude in-situ total column abundancies for GHG monitoring. This measurement technique can be used to calibrate ground and satellite based sensors.

The HiDRON service package offering has the potential to extend the mission life of satellites beyond their intended length with more frequent under-flight campaigns at a fraction of the cost of manned aircraft.
HiDRON
RELEASE ALTITUDE CANADIAN RECORD 111,400 FEET (34KM)

SR-71 BLACKBIRD MILITARY JET
84,480 FEET

GULFSTREAM RESEARCH JET
50,688 FEET

COMMERCIAL AIRLINER
39,072 FEET

CONTROLLED DESCENT
BACK TO LAUNCH
The HiDRON has been effectively deployed both, utilizing typical weather balloons, and integrated within a scientific gondola for longer duration retrievals.
Over 200 flight parameters are recorded with the 10 hz timestamp.

The positional accuracy is about 20 cm. Orientation accuracy is \(~\)0.1 degree. Time resolution is 10 hz.
Recent Achievements

2020
Flight provider for NASA Flight Opportunities Program with the University of Kentucky and NASA LaRC

2019
CNES / Canadian Space Agency collaboration
Payload was a near space flight test for Slovakian Experimental Physics instrument pre-deployment on JEM-EUSO

The campaign set several Canadian aviation records including:
• Highest altitude UAV flight from over 34 km (110,000 feet)
• First UAV flight above 29,000 feet in Class A and B airspace
• First release of a UAV from a scientific gondola in Canada

Awarded funding for unmanned Beyond Visual Line of Sight (BVLOS) demonstration flights through C-CORE, LookNORTH and Unmanned Systems Canada
In addition to the AMON nighttime airglow detector, previous HiDRON payloads include: Radiosonde, in situ measurement of pressure, temperature, and humidity Ozonesonde for measuring ozone

**PAYLOAD CAPACITY:**

- Series A: 800g
- Series B: 6kg
- Series C: 15kg
August of 2020, the HiDRON will be participating in the NASA Flight Opportunities Program to support a collaborative turbulence experiment between the University of Kentucky and NASA Langley.
Contact Nick Craine to receive our latest white paper:
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