



# A NOVEL APPROACH FOR SATELITE CALIBRATION USING AN UNMANNED STRATOSPHERIC GLIDER

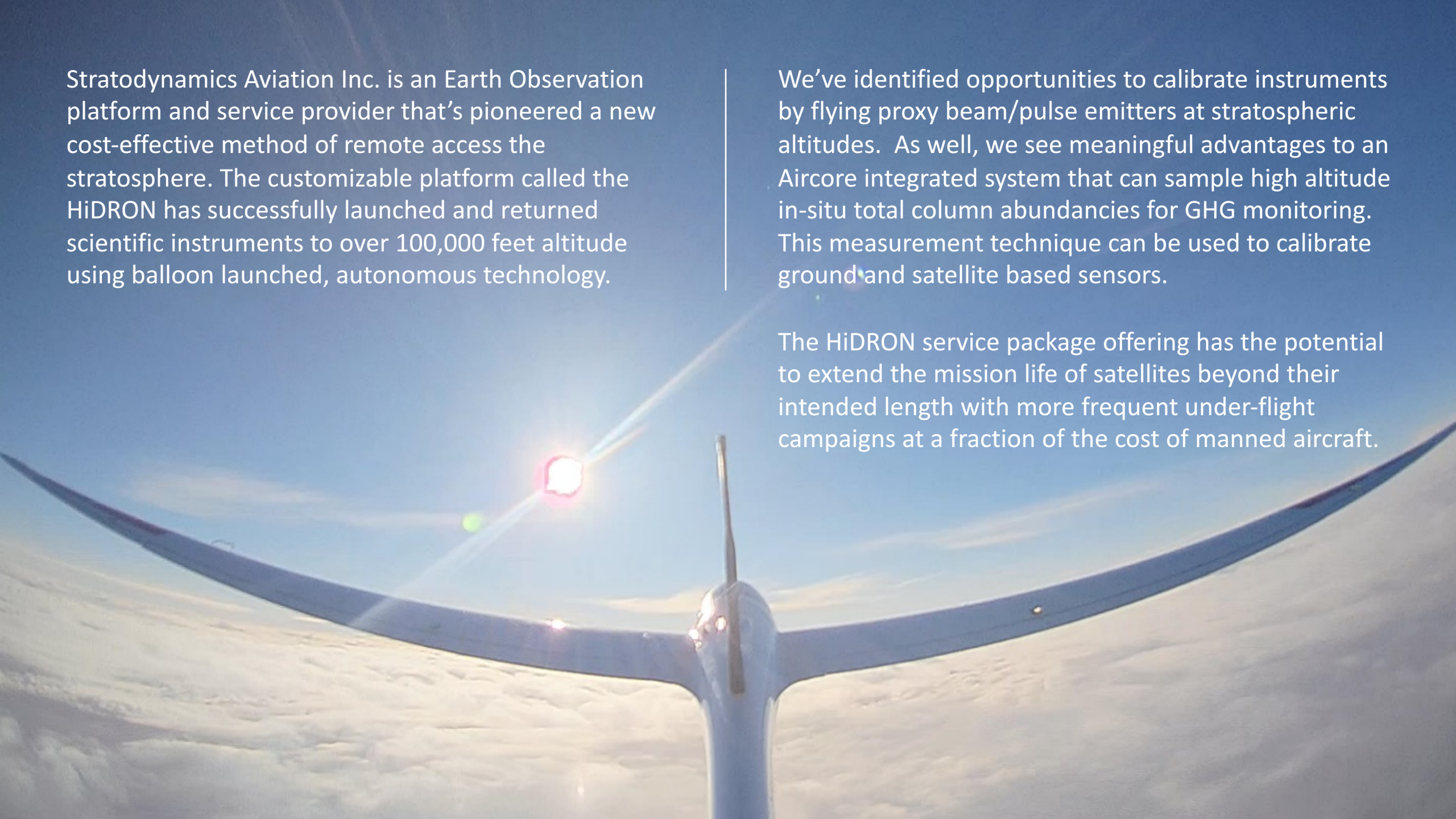
Prepared for the 2020 EGU General Assembly



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



*16 December, 2018 moments before launch at Minsk with an Ozonesonde payload in collaboration with the University of Kentucky*



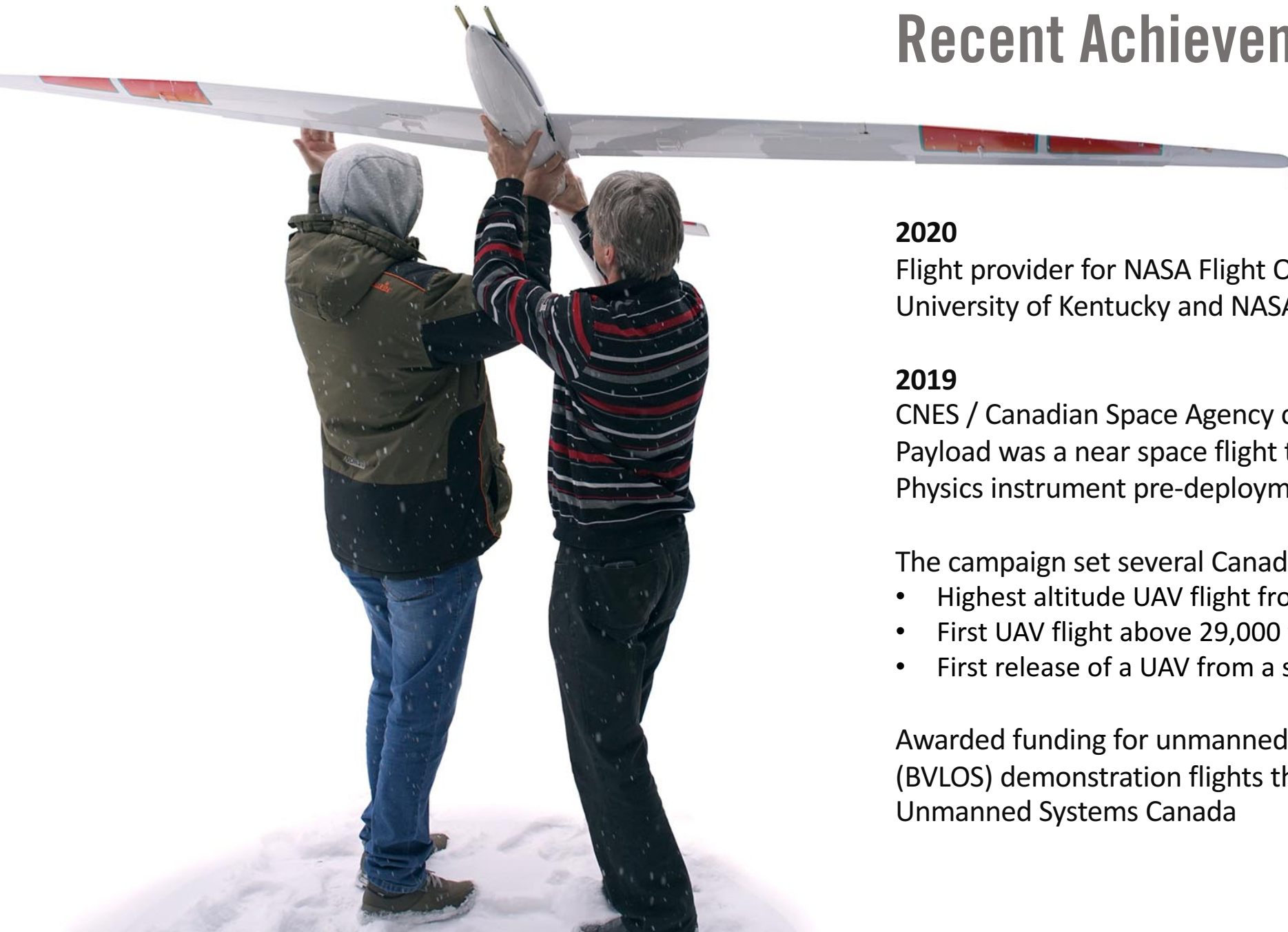
*At the Canadian Space Agency, CNES STRATOS Balloon Base 4 hours prior to launch 31 August, 2019 in collaboration Slovak Academy of Science Institute of Experimental Physics*





The positional accuracy is about 20 cm.  
Orientation accuracy is  $\sim 0.1$  degree.  
Time resolution is 10 Hz.

Over 200 flight parameters are recorded with the 10 Hz timestamp



# 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





A white HiDRON aircraft with a black nose and blue markings is shown from a top-down perspective, flying over a rugged, reddish-brown desert landscape. The aircraft's wings are spread wide, and its tail is visible at the bottom. The text "What's next for the HiDRON?" is overlaid in the upper right quadrant.

## What's next for the HiDRON?

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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go higher



STRATODYNAMICS AVIATION INC