ATON

Stratospheric Platform for Space Technology Tests

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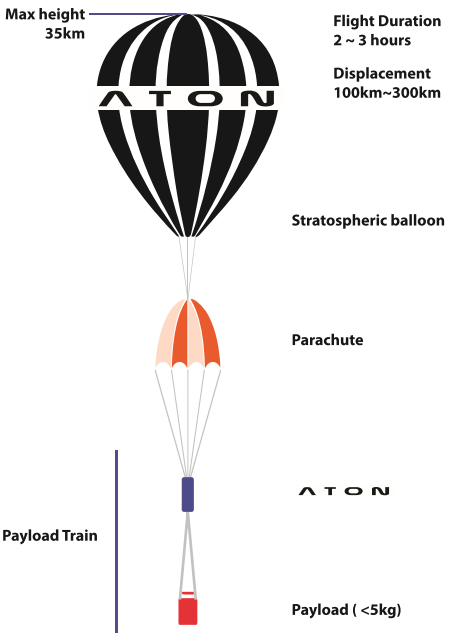


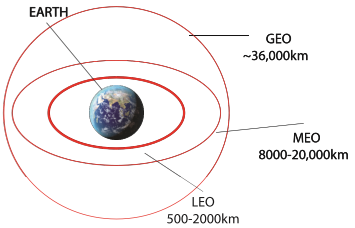
Introduction

The development of experiments or systems that need to be tested and eventually approved for the aerospace sector implies having complex and costly infrastructure to be tested in similar conditions to the ones present whilst on mission or performing the tasks it was designed to.

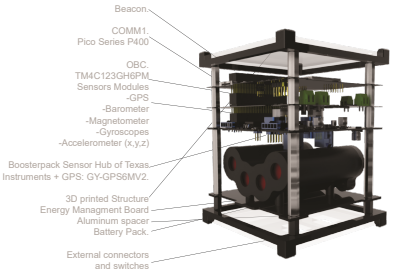
The stratosphere presents very similar conditions to the ones present in Low Earth Orbit (LEO), place for which most of the nowadays developments are tailored, and which is very difficult to simulate if the necessary instruments, facilities and infrastructure are not available.

The characteristics that can be found in this layer of the atmosphere are higher radiation levels, low concentration of water molecules, convection and pressures.

Thereby the use of the stratosphere for performing tests of space technology plays an important role in the development of space technology, and to take advantage of this it is proposed the use of a platform, designed and developed in the Nuclear Sciences Institute (ICN-UNAM) whose name is ATON.

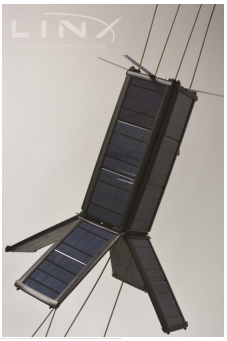


ATON has all the fundamental subsystems to operate stratospheric flights, and carry payloads whose mass does not exceed 5 kg by the use of stratospheric balloons.



Goals

-Give to the academic, industr ial and government sectors a reliable and secure stratospheric access platform for testing engineering models and experiments relates to space technology in Mexico.
-Lower costs and development times.
-Generate human capital in the aerospace area as part of the development of the mexican aerospace sector.
-Creation of a center specialized in the stratospheric access: LANAE
(Spanish: Laboratorio Nacional de Acceso Estratosférico;
English: National Laboratory for Stratospheric Access)

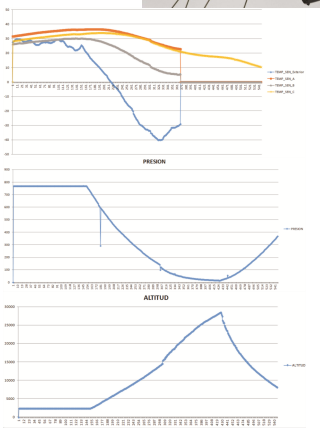


Flight over Mexico with mexican. infrastructure and logistics.
Launch from Hidalgo State.
(colaboration between: LINX-CITNOVA-AEM)
Permanent infrastructure and continuous fluids services.
Use of stratospheric balloons.
ATON platform under Cubesat Standard.
Defined interfaces and services.

Electronic and mechanic interfaces.
Flight services.
Regulated power.
-Monitoring (T,P,h,I,V,a (x,y,z)
Telemetry and remote controls.
Control.
Data Storage
Images and video
Fast response: weeks.
Reliable remote flight termination.

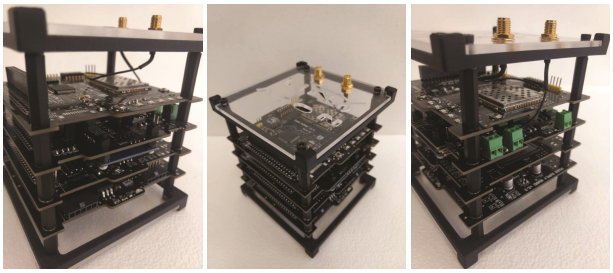
Pre-flight preparation.
Mechanical and electrical integration.
Thermo Vaccum test.

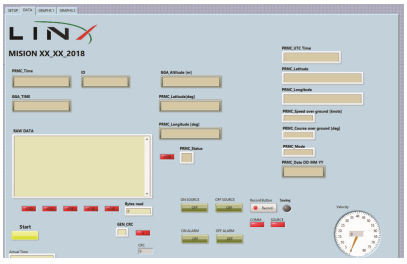
ATON is mainly used to carry scientific and experimental payloads into the stratosphere, which simulates some of the conditions that can be found on LEO orbits, by using latex-based weather balloons, rather than drones, airplanes or rockets.



The recovery of the payload, along with the platform is done by the LINX team, which also designs the passive descend and impact absorption systems so as to have a controlled descend and its own GPS location systems. One of the challenges for the team is to integrate all the subsystems inside a tailored mechanical design, which also uses light and resistant materials that ensure the conservation of the payloads.
ATON is characterized to be have flexibility to integrate multiple personalized and adaptive payloads.

The LINX team develops standardized protocols and interfaces from a modular system, for the support of additional electronic devices.
By an intuitive graphical interface, parto of the ground station it is possible to know the progress of the mission and the conditions that are being experimented by the platform. It also shows and plots its position throughout the flight and it is capable to send commands so as to perform corrective actions.





LANAE Laboratorio Nacional de Acceso Estratosférico
Würth Elektronic
Globalstar
Spacenet
DELORME inReach
CITNOVA
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PRAXIS Space Dreams