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Microgravity Experiments from Sub-Orbital to Orbital Platforms (3)

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SUBORBITAL EXPRESS – SOUNDING ROCKET RIDE SHARE AT ITS BEST

Abstract

The total amount of 12 different experiment payloads from all over the world on one single microgravity sounding rocket mission has been challenging for the engineers at SSC (Swedish Space Corporation) all the way until launch on 23rd November 2022.
The rocket mission was comprised of 5 major experiment setups of which 3 have been part of the ESA European Exploration Envelope Program (E3P). For the first time, SubOrbital Express 3 - M15 (S1X-3) has carried a dedicated platform for a number of small sized experiments in the range of 200 to 1000 gr with a variety of scientific and technical topics.
The suborbital flight of S1X-3 provided 363 sec of microgravity environment for the experiments which performed investigations in various disciplines and areas, such as diabetes, planet formation, liquid evaporation, drug encapsulation, two-phase mixing, banana fungi spores, radiation flux, re-entry and aero-break deceleration systems, medical health monitoring for astronauts and, mechanical watch movements.
SubOrbital Express is a commercial sounding rocket program by SSC, providing easy access to space for research under microgravity, Moon- or Mars gravity, and serving as in-situ platform for astronomical and astrophysics experiments in the upper Mesosphere and Thermosphere regime. The sounding rocket missions are performed regularly from above the polar circle at Esrange Space Center / Kiruna in northern Sweden, with a flight heritage of more than 50 years.
The paper gives a detailed description of the past SubOrbital Express 3 mission and the experiments on board, facilitating the first commercial approach for small sized scientific and technological experiments on a ride share approach. Furthermore, it will outline the upcoming 2024 mission SubOrbital-Express-4 with the booked ride-share payloads and the scientific objectives.