

IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Facilities and Operations of Microgravity Experiments (5)

Author: Mr. Gunnar Florin
Swedish Space Corporation (SSC), Sweden

Mrs. Anne Ytterskog
Swedish Space Corporation (SSC), Sweden

Mr. Christian Lockowandt
Swedish Space Corporation, Sweden

Mr. Mats Tyni
Swedish Space Corporation (SSC), Sweden

Mr. Christian Krokstedt
Swedish Space Corporation, Sweden

Mr. Mattias Abrahamsson
Swedish Space Corporation, Sweden

FREQUENT MICROGRAVITY SUBORBITAL SERVICE - A DOOR OPENER TO SPACE FOR ALL

Abstract

The suborbital rocket is not a newfangled thing, even though new operators are now entering the market offering suborbital flight opportunities for microgravity research to fill a growing demand. Suborbital rockets started the space era in the end of the 1940s and have since then been a reliable and cost-efficient work horse for different types of near-earth, space and atmospheric missions. Suborbital rockets and adherent services are continuously subject to improvements and developments.

SSC has accommodated, developed, launched and operated over 50 microgravity experiments for suborbital flights. Launches take place from Esrange Space Center, Europe's only suborbital rocket launch site with land recovery, where payloads are retrieved from a vast restricted ground impact area within hours. Apogees range from 50 to 260 km, even up to 720 km.

In 2018 SSC began offering flight opportunities on its suborbital rockets to the global market and now offers regular flights to customers worldwide for mission such as research in microgravity, technology demonstrations, drop and re-entry tests, to name a few. Frequent suborbital flight services are provided as a "flight ticket" concept available for everyone, with a complete and regular service capacity that fulfills the users' needs, at competitive prices.

The spectacular rocket flight is only one part of the process chain elements that guarantee successful user results. Of no less importance is the mission provider's ability to supply capable launch site infrastructure. The infrastructure must be suitable to fulfill the high demands for experiment preparations, biological laboratories, clean room conditions, reliable experiment command and monitoring infrastructure as well as critical on-site skilled 24/7 engineering support, which ever so often contributes to saving experiments from last-minute exigent states prior to launch.

Accommodating several experiments on the same flight also opens the door to space for any institute and small organization that, on short notice, need a flight opportunity for single or small experiments without having to cover the cost of a complete mission. Smaller experiments and flight items that occupy small space can be accommodated in "last-minute" payload bay areas or be placed in CubeSat racks with simple, transparent CubeSat interfaces.

SSC's frequent suborbital flight ticket service focuses on providing a complete and regular service capacity that fulfills the users' needs and, last but not least, skilled flight preparations support, flight

operations and secure post-flight activities designed to ensure mission success.

The concept is further elaborated in both the presentation and the paper.