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

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SUBORBITAL INEXPENSIVE ROCKET (SIR) – OVERVIEW OF THE PROJECT RESULTS AND FURTHER DEVELOPMENT PLAN OF PERUN SUBORBITAL ROCKET

Abstract

This paper describes results of the SIR project, which aimed at building and testing PERUN suborbital rocket, by a polish company – SpaceForest. Specifically, it focuses on data that was acquired during two test flights in 2023. Both flights, although not completely successful, have proven maturity of most of the subsystems and gave hope for the PERUN rocket to soon become operational. PERUN, a reusable suborbital rocket developed by the Polish company SpaceForest, is engineered to transport scientific and commercial payloads of up to 50 kg to altitudes reaching 150 km. During its standard flight, PERUN offers approximately 5 minutes of microgravity and access to high-speed testing environment. The main goal of PERUN's development is to cut expense necessary to fly to space by prioritizing reusability. Commencing its development in mid-2018, the PERUN rocket is now nearing completion. In the last section, further improvement of the rocket and upcoming space flights plans are described.