## IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2) Future Space Transportation Systems Verification and In-Flight Experimentation (6)

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THE ILR-33 AMBER 2K ROCKET – DEDICATED ACCESS TO SUBORBITAL EXPERIMENTATION

## Abstract

ILR-33 AMBER rocket has been under development since late 2014 by Warsaw Institute of Aviation. The platform was verified in 2017 during a successful low-altitude flight and thus became the first rocket in the world that utilizes High Test Peroxide of 98The article presents the rocket's performance as a microgravity platform and for suborbital testing of rocket-related technologies. AMBER 2K aims at relatively small experiments that require dedicated and quick access to space, what is in line with New Space trends. Due to the compact size of the rocket it is possible to provide services in Polish test ranges for limited apogees, exceeding stratospheric platforms' capabilities, but still sufficient for specific payloads. The article covers ground and in-flight test results. Consecutive flights of ILR-33 AMBER in 2019 are discussed. Test stand performance of the improved version of Solid Rocket Boosters is presented. The AMBER rocket can also be treated as a technology demonstrator. Concepts of guidance and orientation control systems are shown. The guidance control is based on a canard subystem, which has been developed up to engineering model. The orientation control system concept is intended for microgravity flight phase and is based on Hydrogen Peroxide thrusters.