

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

Author: Mr. Blazej Marciniak
Institute of Aviation, Poland

Mr. Bartosz Bartkowiak
Institute of Aviation, Poland
Mr. Wojciech Florczuk
Institute of Aviation, Poland
Mr. Kamil Sobczak
Institute of Aviation, Poland
Mr. Damian Kaniewski
Institute of Aviation, Poland
Mr. Jan Matyszewski
Warsaw Institute of Aviation, Poland
Mr. Adam Okninski
Institute of Aviation, Poland
Mr. Pawel Nowakowski
Institute of Aviation, Poland
Mr. Michal Pakosz
Institute of Aviation, Poland
Mr. Dawid Cieslinski
Institute of Aviation, Poland
Dr. Grzegorz Rarata
Institute of Aviation, Poland
Mr. Pawel Surmacz
Warsaw Institute of Aviation, Poland
Mr. Dominik Kublik
Institute of Aviation, Poland
Mrs. Karolina Rokicka
Institute of Aviation, Poland
Mr. Jaromir Smetek
Institute of Aviation, Poland
Mr. Damian Rysak
Institute of Aviation, Poland
Prof. Piotr Wolanski
Polish Academy of Sciences, Poland

DEVELOPMENT OF ILR – 33 AMBER SOUNDING ROCKET FOR MICROGRAVITY
EXPERIMENTS**Abstract**

Paper gives an overview of the development of ILR – 33 Amber sounding rocket designated for mi-

crogravity experiments, that was performed in Institute of Aviation in Warsaw, Poland. The lack of easy accessible and affordable platform for this kind of research was one of the key reasons for this work. Proposed design enables to perform experiments in microgravity for almost 150 seconds with apogee over 100 km. Combining this results with relatively low price per launch and short deployment time gives firm position on the market. The paper covers different type of payload considerations and cost analyses. This article describes also rocket design and its capabilities. Proposed design utilizes hybrid type of rocket motor with High Test Peroxide as an oxidizer along with two reusable solid rocket boosters. The early phase analysis of the rocket configuration and propellant considerations are also presented in the paper. Furthermore already performed testing phase including: wind tunnel research, motors design, manufacture and tests and drop down tests is also covered in this article. The proposed design is also considered as introduction phase for small rocket launcher that could deliver pico and nano satelites to LEO orbits. This solution is described by the possibility of rocket air-platform launch.