Paper ID: 53184
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IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Facilities and Operations of Microgravity Experiments (5)

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MIGROP - PARABOLIC FLIGHT WITH LIGHT AIRCRAFT – ON THE THRESHOLD OF THE MARKET LAUNCH

Abstract

Parabolic flight is well known as test platform for experiments under zero-g conditions. NASA and ESA offer zero-g opportunities with their large aircraft (Boeing, Airbus). This is an important part of the available zero-g research facilities, especially when a person needs to observe and control the experiment, which is not possible in drop tower facilities or sounding rockets. The main advantage of a large aircraft is the long zero-g duration and the high payload capacity. A team of pilots, scientists and engineers in Bremen (Germany) develops the project MIGROP (Microgravity Operations) for zero-g, partial-g and hyper-g flight opportunities with light aircraft < 5.7t that show several advantages compared to other facilities. Smaller aircraft show shorter zero-g duration and a smaller payload capacity. The big advantages are the reduced centrifugal acceleration levels, the bigger flexibility in terms of flight scheduling and consideration of individual customer needs, the possibility to perform hundreds of parabolas within a short period - and finally a very competitive price calculation. Due to the reduced effort for preparing flight campaigns which carry single experiment teams (compared to the many team campaigns of ESA or NASA), the lead time for the customer is drastically reduced and the corresponding flexible scheduling can meet the customers' demands in a very comfortable way. If needed, the aircraft can even fly to an airfield near the customer for a rather low rate. The payload capacity is around 150kg plus 1-2 people for experiment control. The experiment duration depends on the mode (7.5-12 seconds for zero-g and partial-g, minutes for hyper-g). A new mode is under development which allows a smooth and direct transition from 1g to zero-g without the typical initial increased g-phase. This mode might be interesting for special experiments. In 2018/2019 many test flights have been carried out with a C206. For late 2019 we plan the market launch with regular flight operation. This contribution gives a detailed status update of the project.