

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Lift Off - Secondary Space Education (2)

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MICROGRAVITY EXPERIMENTS WITH SAILPLANES: EDUCATIONAL BENEFITS OF A  
PARABOLIC FLIGHT CAMPAIGN WITH SCHOOL STUDENTS**Abstract**

Several educational activities related to space aim to encourage younger generations to develop a passion for the space sector. Many of those activities explain technical concepts and physical principles of space technologies. The costs and efforts to simulate a space environment like microgravity are too high to justify the educational benefits. In this paper a project using a cost effective approach with sailplanes to do microgravity research on Earth is described.

Sailplanes can be used to obtain several seconds of microgravity by performing a parabolic flight. The facilitated microgravity lasts about 4 seconds, which is enough time to feel the sensation of microgravity and study the effects with simple microgravity experiments. The costs for a flight campaign with a sailplane are within the budget of a high school and the flight can be undertaken at every airport with general aviation. A pilot that carries a license to fly gliders can perform the flights and experiments. This project design, called aer0g, can be offered to high schools to give students the opportunity to arrange and perform self-designed microgravity experiments as part of their academic education. The developed experiments can be related to the fields of materials, fluid sciences, life sciences or ergonomics.

The BORG Monsbergergasse, a secondary school in Graz in Austria, organized a parabolic flight campaign with gliders on a local airport supported by local institutions and Astrinova, which is an association that helps to make space research and its importance more transparent to the public. The students and the pilot performed eight flights with around 40 parabolas. The accomplished total time of microgravity was two minutes. The students were all 16 years old and prepared the experiments in their classroom, with assistance and suggestions for their experiments from Astrinova. All flights were performed during one weekend and were video taped to document the experiments. The aim of this paper is to explain the process for realizing such an activity taking the flights in Graz as a case study, and to present the results towards its educational impact. The aer0g platform can easily be modified and copied to perform space related educational projects in microgravity.