

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

Author: Dr. Thorben Könemann
ZARM Fab GmbH, Germany

Mr. Peter von Kampen
ZARM Fab GmbH, Germany

Mr. Christian Eigenbrod
University of Bremen, Germany

Prof. Hans Rath
ZARM Fab GmbH, Germany

20TH ANNIVERSARY OF MICROGRAVITY EXPERIMENTS AT THE DROP TOWER BREMEN
AND 25TH ANNIVERSARY OF THE CENTER OF APPLIED SPACE TECHNOLOGY AND
MICROGRAVITY (ZARM)

Abstract

The Center of Applied Space Technology and Microgravity (ZARM) headed by Prof. Dr.-Ing. Hans J. Rath is part of the Department of Production Engineering at the University of Bremen in Germany. In September 1985, the institute was established as a research center mainly concentrated on the investigation of phenomena under conditions of weightlessness and questions related to space technology. Within only 6 years ZARM became the largest and one of the most important university institutes for space technology in Europe. ZARM employs about 80 scientists, engineers and administrative staff as well as many students from different departments like production engineering, physical sciences or information technologies. With a height of 146m the Drop Tower Bremen is the predominant facility of ZARM and also the only drop tower in Europe. ZARM's ground-based microgravity laboratory offers the opportunity for daily short-term experiments under conditions of high-quality weightlessness (10-6g).

The ZARM Drop Tower Operation and Service Company (ZARM FAB mbH) was established in 1990 along with the start of operation of the Drop Tower Bremen and employs further technical and administrative staff to operate and to maintain the drop tower facility. Since then, ZARM FAB mbH has accomplished more than 5500 drops of a variety of different microgravity experiments. Today, two different microgravity modes are available at ZARM's drop tower, the scientists can choose between a single drop experiment with a free-fall duration of 4.74s and a catapult experiment with 9.3s of weightlessness. This world-wide unique capsule catapult system developed by ZARM FAB mbH started its operation of microgravity catapult experiments in December 2004. After the inauguration of the catapult system ZARM FAB mbH has accomplished hundreds of catapult launches up to now. Either in the drop or in the catapult operation routine the repetition rates of microgravity experiments at the Drop Tower Bremen are always the same, generally up to 3 times per day.

According to the 20th anniversary of microgravity experiments at the Drop Tower Bremen and the 25th anniversary of ZARM both celebrated in November 2010 we will present you the entire success story of ZARM and its unique ground-based microgravity laboratory, which is easily accessible for all low-gravity scientists worldwide to perform their short-term experiments under conditions of high-quality weightlessness. All the time, ZARM and ZARM FAB mbH gratefully acknowledge the support from the German Aerospace Center (DLR) and the European Space Agency (ESA).