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# THE EDEN ISS ANTARCTIC GREENHOUSE PROJECT – 9 MONTH MISSION STATUS AFTER DEPLOYMENT IN ANTARCTICA

**Abstract**

Sustained human presence in space requires the development of new technologies to maintain environment control, to provide water, oxygen, food and to keep astronauts healthy and psychologically fit. The cultivation of higher plants can contribute to all major aspects within biological life support systems and represents an all-in-one-approach, not accomplished by any single physical/chemical system. The international EDEN ISS project aims to develop and validate technologies as well as investigate food safety and plant handling procedures for higher plant cultivation. A dedicated greenhouse module called the Mobile Test Facility was built by an international consortium within the European Horizon 2020 framework. The EDEN ISS consortium focused on advancing controlled environment agriculture technologies and adjoining research fields for safe food production in closed-loop space systems such as planetary habitats and transfer vehicles. A key element of the project is the testing of the greenhouse system during an analogue mission at the Neumayer Station III in Antarctica. In addition to advancing hardware for space flight, the facility provides the overwintering Neumayer Station III crew of 10 people with fresh vegetables. The paper presents the current mission status (after 9 months) of the EDEN ISS mission.

An overview of the as-built design configuration of the Mobile Test Facility is described. A detailed overview of the assembly integration and test phase is given that took place at the DLR Institute of Space Systems during 2017. Further, the main phases of the December 2017 to February 2018 deployment mission in Antarctica are presented. First observations of the ramp up phase are given and first scientific outcomes are also presented.