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PBR@LSR EXPERIMENT – READY TO FLY

**Abstract**

The PBR@LSR (Photobioreactor at the Life Support Rack) experiment will be launched to the International Space Station in November 2018. Its goals are to demonstrate the technology and performance of a hybrid life support system (combining physico-chemical and biological components) in space and to prove the feasibility of non-axenic long-term cultivation of microalgae (*Chlorella vulgaris*) for up to 180 days under space conditions. The photobioreactor experiment will be connected to the European Life Support Rack (LSR, formerly known as ACLS - Advanced Closed Loop System), which uses physico-chemical technologies to collect and process the carbon dioxide produced by the astronauts into oxygen. The photobioreactor (PBR) as biological component will use a surplus of the highly concentrated CO<sub>2</sub> air of the LSR to produce oxygen and biomass. The experiment and development of the g adapted PBR was initiated in 2014 by DLR and the Institute of Space Systems (IRS) of the University of Stuttgart with Airbus Defence and Space as prime for the flight hardware. The experiment consists of an algae-suspension loop, lighting, gas handling system, humidity control, sensors and a liquid exchange device. Several experiments have taken place, regarding light regimes, nutrient feeding interval testing, sensors characterization, etc. This presentation shows the final configuration of the PBR@LSR flight experiment and explains the selection of the different components through laboratory experiments.