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Simulating Space Habitation: Habitats, Design and Simulation Missions (6)

Author: Dr. Agata Kolodziejczyk
Analog Astronaut Training Center, Poland, fichbio@gmail.com

Mr. Matt Harasymczuk
Analog Astronaut Training Center, Poland, matt@astronaut.center

STANDARIZATION OF SPACE ANALOG MISSIONS
FOR IMPROVEMENT OF SCIENTIFIC OUTCOME

Abstract

Growing interest in commercial scientific analog missions, bringing not only experience but also relevant scientific results in relatively short time (comparing to regular projects at universities or during internships), increases number of participants, mainly students developing their careers in space sector. Standardization of such missions increases statistical power of data obtained in analog conditions as well as it decreases costs of participation, allowing more people to come. This positive feedback is not the only one advantage. Standardization allows continuous increase in quality of educational aspect based on lessons learned obtained in the process.

AATC organizes about 10 missions per year with more than 50 analog astronauts onboard. Because AATC is a company created by scientists, organised analog missions are focused on realisation of multidisciplinary scientific experiments, engineering, master and doctoral theses. Comparing to other options, making space science in analog environment is demanding and hard but at the very end much easier to publish.

We were forced to standardize missions in 2019, when we started continuous studies on humans driven by bioethical committee's policy. In order to get comparable data, participants of multiple experiments should be kept in the same laboratory conditions, run same questionnaires, and keep the same timing. For each new season of analog missions, a set of experiments is proposed and incorporated into the backbone of the mission manual. We standardize such parameters as food (type of diet), mission schedule, water uptake, physical activity, or filling tables with physiological and psychological data.

In this work we describe critical aspects of standardization of space analog missions in order to be able to obtain significant data from research on humans. We strongly advice to implement this type of methodology, especially for people who have no experience in running their own projects in extreme environments.