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HUMAN ROBOTIC PARTNERSHIP INVESTIGATIONS DURING DECEMBER 2016 ILEWG EUROMOONMARS SIMULATION CAMPAIGN IN EIFEL VOLCANIC AREA

Abstract

The aim of the ILEWG EuroMoonMarsEifel December 2016 campaign was to test human robotic partnerships and operations with remotely controlled experiments and simulating the interaction with astronauts. In this campaign a lander was used to conduct experiments and in situ geological scientific analysis of samples, with a teleoperated rover and UV-VIS reflectance spectrometer. Moon-Mars analogue missions using a mock-up lander that is part of the ESA/ILEWG ExoGeoLab project were conducted during Eifel field campaigns in 2009, 2015 and 2016 (Foing et al., 2010; Kamps et al., 2016). The Eifel region in Germany where the experiments with the ExoGeoLab lander were conducted is Moon-Mars analogue due to its geological setting and volcanic rock composition. The research conducted by analysis equipment on the lander could function in support of Moon-Mars sample return missions, by providing preliminary insight into characteristics of the analyzed samples. The set-up of the prototype lander had cameras and UV-VIS reflectance spectrometer together with computers and a sample webcam were situated in the middle compartment and to the side a sample analysis test bench was attached, attainable by astronauts from outside the lander. Locations of suitable sampling sites were communicated to the astronauts, before being acquired during a simulated EVA. Sampled rocks and soils were transported by the rover or by astronauts and remotely analyzed by the base control center, while the astronauts assisted by placing the samples onto the sample holder and adjusting test bench settings in order to obtain spectra. After analysis the collected samples were documented and stored by the astronauts, before returning to the base.

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