EANA16, 27.09.-30.09.2016, Athens, Greek

EXPOSE-R2, the 3rd successful EXPOSE mission – a mission and mission ground reference overview

Elke Rabbow[1], André Parpart[1], Peter Weiß[2], Rainer Willnecker[2], Petra Rettberg[1]

1 German Aerospace Center (DLR e.V.), Institute for Aerospace Medicine, Radiation Biology Department

2 German Aerospace Center (DLR e.V.), MUSC

For nearly 2 years the 3rd ESA EXPOSE mission, the 2nd on the Russian Zvezda module of the ISS, exposed a variety of astrobiological samples to space and simulated Mars environmental conditions. Various chemical compounds and organisms like bacteria, archaea, fungi, plant seeds, lychens, mosses and animal eggs and larvae from the international experiments BIOMEX, BOSS, P.S.S. and the IBMP-experiment were exposed to space vacuums dryness, extraterrestrial short wavelength UV, radiation and temperature oscillation or Mars-like conditions comprised of a 980 Pa pressure CO_2 dominated gas mixture and solar UV modulated to simulate Mars surface solar radiation. The complete mission was simulated under ESA contract in the Planetary and Space Simulation facilities at DLR Cologne according to mission data received from the ISS and to UV radiation calculations by RedShift.

For both, the space mission and the ground reference an operations overview from the preparation to launch, space exposure and return will be presented.

Comparisons of the mission history with the two previous EXPOSE missions are shown.