SPACE OPERATIONS SYMPOSIUM (B6)
New Operations Concepts (2)

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MISSION OPERATIONS CONCEPTS FOR ROBOTIC MISSIONS

Abstract

DLR's German Space Operations Center (GSOC) and its Robotics & Mechatronics Center (RMC) are presently involved in the preparation of the robotic mission DEOS. The goal of DEOS is to demonstrate the capture of a tumbling non-supportive client satellite. This has been prepared by several robotic experiments in space, ROTEX on the Shuttle flight STS 55 in 1993, GETEX on ETS VII in 1999 and ROKVISS since 2005 on the ISS. Experience regarding the approach navigation was gained by operating the close formation of TanDEM-x (<200m) or the technology demonstration PRISMA (<1m).

In order to consolidate the experience made during the past decades the study Mission Control Concepts for Robotic Operations (MICCRO) is currently performed by VCS and DLR. The study reveals the communalities in the operations of past and current robotic space missions in order to find a representative mission control concept for robotic missions. The existing operational concepts, responsibilities and information flows during the different mission phases are taken into account. A particular emphasis is put on the possible interaction between different autonomous components (on-board and on-ground), their synchronization and the possible shift of autonomy borders during different mission phases. Additionally, communication constraints are investigated including the impact of telepresence on the communication architecture. Finally, we also investigate the consequence on roles and responsibilities since telepresence introduces a new time scale in decision making.