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TELEROBOTIC OPERATIONS WITH TIME DELAY, RESULTS FROM THE ISECG GAP ASSESSMENT TEAM

Abstract

As documented in the new Global Exploration Roadmap (GER18) there is an increasing push for robotic missions to the Moon and Mars involving increased levels of complexity. Robotic exploration missions can be done using different approaches with respect to autonomy, ranging from pure remote control with direct sensory feedback to fully autonomous systems. The International Space Exploration Coordination Group (ISECG) formed two Gap Assessment teams to evaluate topic discipline areas that traditionally had not been assessed at an international level to-date. Accordingly, the ISECG Technology Working Group (TWG) recommended two discipline areas based on Global Exploration Roadmap (GER) Critical Technologies needs reflected within the GER Technology Development Map (GTDM); the first topic discipline being Telerobotic Operations with Time Delay, and the second topic discipline area being Autonomy. The ISECG approved the recommended Gap Assessment teams, and tasked the TWG to formulate the new teams with membership from the participating agency Subject Matter Experts (SME's). In this paper, the results from the GAP assessment Team regarding "Telerobotic Operations with Time Delay" will be concluded and compiled. This includes the following key aspects:

- Definition and clarification of the different common wordings on how to tele operated robots
- Analyses of the key control mode in operations
- Discussion of the probably required tasks to be solved in future planetary missions
- Resulting analyses of the GAPS, regarding the current capabilities and the expected required tasks
- Suggestions for Improvements and Outlook