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Author: Mr. Darrell Jan
Caltech/JPL, United States, djan@jpl.nasa.gov

ENVIRONMENTAL MONITORING AS PART OF LIFE SUPPORT: DEEP SPACE MISSIONS

Abstract

Like previous crewed space missions, future missions to the deep space will have requirements for monitoring the crew habitat. Monitoring serves both to assure the quality of air and water, and to enable efficient, properly functioning life support processing. Missions in low Earth orbit, such as the International Space Station (ISS), can rely to a large degree on ground analysis of air and water samples that are returned to earth. But monitoring the crew habitat becomes more critical in long term missions, when resupply from earth and return of material to earth are highly impractical or impossible. Therefore the onboard monitoring capabilities for such missions will be broader, perhaps even approaching the capabilities on the ground. Furthermore, the deep space vehicle habitat is likely to be far smaller than ISS, thus the available resources for mass and volume are likely to be smaller—a challenging scenario. In development of the appropriate monitoring systems, it is important to anticipate the future requirements when applying the technologies to testbed operation. This paper will describe the state of requirements for technology development for environmental monitoring of future deep space missions.