Return to the Moon (02)
Goals and Status of Future Lunar Missions (2)

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PAYLOADS FOR THE LUNAR LANDER MISSION STUDIED BY KAYSER-THREDE

Abstract

Europe is presently preparing a robotic mission to the Earth's Moon. The mission under study called Lunar Lander, is aiming for a landing near the lunar south pole in the year 2018.

Payload studies are presently being performed by European Industry under ESA, but also with national funding. Kayser-Threde is leading or significantly involved in the following payload studies:

1. L-DEPP L-DEPP is a "Lunar Dust Environment and Plasma science Package" accommodated on the upper deck of the ESA planned Lunar Lander vehicle for investigation of the plasma, charged/levitated dust and electromagnetic environment of the Moon. One objective of the intended investigation focuses on the transfer period between daylight and short darkness periods where great changes in this environment are expected. 2. L-DAP L-DAP is a 'Lunar Dust Analysis Package' accommodated on the lander spacecraft to determine at the microscopic scale the mineralogic and elemental composition, the concentration of absorbed volatiles as well as key physical properties of lunar regolith samples delivered to the instrument. This is achieved by a combined Raman and LIBS spectrometer coupled with optical and atomic force microscopy. 3. MPE In late 2010, the German Space Agency, DLR, invited German industry to submit a proposal for a study about a Mobile Payload Element (MPE) which, as a baseline, could be a German national contribution to the Lunar Lander ESA Mission. MPE is designed to be a small autonomous innovative vehicle in the 10 kg class The MPE shall be a sample fetching rover. It will collect samples from areas largely uncontaminated and from shadowed surface and subsurface locations and bring them back to the lander in a controlled manner for onboard analysis, e. g looking for volatiles. Kayser-Threde, Germany, as the Phase 0/A industrial prime, has assembled relevant German industrial and institutional competences in space robotics for this study. The core study team led by Kayser-Threde consists of the companies von Hoerner Sulger in Schwetzingen and Astrium in Bremen, and two institutes, the DLR Institute for Robotics Mechatronics in the Greater Munich area and the German Institute for Artificial Intelligence, DFKI, in Bremen.

MPE is finishing its phase A study in early 2012. A concept with active chassis suspension has been derived which is a good compromise between technology and performance under the given mass budget constraints.