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Lunar Dust Environment and Plasma Package for Lunar Lander - Denition Study

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Dust, the charged lunar surface, and the ambient plasma form a closely coupled system. The lunar surface is permanently under the in turn may lead to mobilization and transport of charged dust particles. Furthermore, the environment can become even more complex in the presence of local crustal magnetic anomalies or due to sunlight/shadow transitions. A detail understanding of these phenomena and their dependence on external in uences is a key point for future robotic/human lunar exploration and requires an appropriately tuned instrumentation for in situ measurements. We present preliminary results from the concept and design phase A study of the Lunar Dust Environment and Plasma Package (L-DEPP), which has been proposed as one of model instrument payloads for the planned Lunar Lander mission of the European Space Agency. Focus is held on scientic objectives and return of the mission with respect to environmental and mission technology constraints and requirements. L-DEPP is proposed to consist of the following instruments: ELDA - Electrostatic lunar dust analyser, LP - Langmuir probe, RADIO - Broadband radio receiver and electric eld antennae, LEIA - Lunar electron and ion analyser, and MAG - Flux-gate magnetometer. In addition to the dust and plasma measurements the RADIO experiment will provide a site survey testing for future radio astronomy observations.