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The LUVMI Imaging System

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LUVMI (LUnar Volatiles Mobile Instrumentation) is a lunar rover mission concept funded by H2020. The payload is a volatiles sampler and analyser which will accurately measure lunar volatile distribution over a wide area, including in Permanently Shadowed Regions (PSR). The 24 month project will develop to TRL6 instruments that together form a smart modular mobile payload that could be flight ready in 2020.

The imaging system on LUVMI will consist of two light-field cameras. The navigational camera will provide 3D images of the rover's environment for teleoperation or autonomous navigation. A surface camera will provide close-up images of the lunar regolith and allow depth measurement of the rover tracks. The cameras will also acquire high quality imagery of mission equipment and of Earth.

Each camera will low power and low mass in line with LUVMI's compact nature. The power requirement will be 4W peak for up to two sensors, not including illumination, the volume is expected to be below 50 mm x 50 mm x 200 mm per sensor, and the mass below 400 g per sensor. Calibrated depth information will be available from single images without an active focusing mechanism.

In this work, we present design details and results from the prototype cameras.

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