Basic development of stereo camera on board heat probe rover for lunar exploration

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The measurement of surface heat fluxes is important to elucidate the evolutionary processes of the Moon. Our laboratory aims to measure the lunar heat flux with a robotic rover ('heat probe rover') in the same way as in the experiment where Apollo astronauts measured heat flux by sticking a heat probe into the lunar surface. This study reports on the development of a stereo camera to be mounted on the heat probe rover. The stereo camera approaches an ideal stereo device by calibrating and collimating the two lenses, and acquires highly accurate parallax maps and three-dimensional coordinates by stereo matching. The disparity acquired by the stereo camera is converted into distance to create a distance image, and a DEM (Digital Elevation Map) is created from the point point cloud. This presentation presents the development status and accuracy of a system that creates DEMs with on-board processing using a 32-bit microcomputer.

Keywords: stereo camera, heat probe, lunar rover

