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Experiments and instruments of Lunar Mission BW1

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As part of the Stuttgart Small Satellite Program, Lunar Mission BW1 - a small lunar orbiter - is currently developed at the Institute of Space Systems (IRS) of the Universitaet Stuttgart, Germany. The cubical shaped spacecraft with an edge length of 1 m and a mass of approximately 200 kg will be launched into GTO and will use its own all-electrical propulsion system, consisting of a thermal arcjet and a cluster of instationary magneto plasma dynamical (IMPD) thrusters to reach a high-inclined low lunar orbit. This paper gives an overview about the mission of the satellite and some possible experiments during its 2 year journey in cis-lunar space as well as during its operational phase in lunar orbit. Being a technology demonstration mission, one of its main experiments is the operation of the propulsion system whose behavior in space environment has to be monitored carefully. This paper describes a possible payload of the spacecraft including a matrix camera operating in the visual and near infrared spectral range, a micro-bolometer array to detect thermal infrared radiation in high resolution, an instrument to count lunar impact flashes on the lunar surface, and dust and space debris sensors. Furthermore, it gives information about requirements and constraints including access times and possible data rates using the Ka-band communication link.