

Future Observation of Circumlunar Dust Particles by Lunar Dust Monitor Onboard the Orbiter of the Next Japanese Lunar Mission

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Lunar Dust Monitor (LDM) is proposed to be onboard the orbiter of the next Japanese lunar mission SELENE2, which is planned to launch in mid 2010 [1]. LDM has a large sensitive volume for a quantitative study of circumlunar dust.

Dust particles around the Moon include interplanetary dust, β meteoroids, interstellar dust, and possibly lunar dust that originate from the subsurface materials of the Moon. It is considered that several tens of thousands of tons of dust particles per year fall onto the Moon and bombard the lunar surface. Some of them have impact velocities enough to vaporize the lunar soil. The vaporization of ferrous surface silicate soils forms nanophase metallic iron particles glassy coat, which causes the space weathering of the lunar surface [2]. The space weathering changes optical property on airless silicate bodies such as the Moon and Mercury [3]. Mercury Dust Monitor (MDM) will be onboard the BepiColombo Mercury Magnetospheric Orbiter (MMO) to conduct observation of cosmic dust in the vicinity of Mercury [4]. Cosmic dust observation by MDM can be compared to one by LDM for the flux of inflow dust particles. Such comparison is very interesting for dust particle environments at different locations and also is important for the comparison of space weathering on airless bodies. The weathering effect can be inferred from the measurement of the flux of inflow dust particles even in the present.

In this paper, we summarize the significance of circumlunar dust and report predicted observation of the LDM.

References

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