



## **Interaction of the lunar surface and dust grains with the solar wind and Earth magnetosphere**

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Interaction of the lunar surface with the solar wind and Earth's magnetosphere leads to it charging by several processes as photoemission, a collection of primary particles, and secondary electron emission. The parameters of a plasma environment strongly influence the charging processes because the energy of electrons and ions is significantly higher in the magnetosphere than in the solar wind, while the particle density is lower in the magnetosphere. Dominant charging currents depend on a lunar position relative to the Earth as well as on the Solar Zenith Angle which influences mainly the current of photoelectrons. The lunar surface potential varies from slightly positive to large negative values with respect to the surrounding plasma. A presence of dust levitating above the surface has been observed by several spacecraft and by astronauts during Apollo missions in the terminator area. We present model calculations of a temporal evolution of the lunar surface potential as well as potentials of dust grains above the surface using by the ARTEMIS data through one crossing of the Earth magnetosphere tail. We show that the lunar surface and levitating dust can be charged to different potentials under the same plasma conditions and we discuss a possibility of the dust grain levitation above the charged surface.