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Dust detector for a Lunar orbiter

S. Kempf (1), R. Srama (1), G. Moragas-Klostermeyer (1), H. Henkel (2), R. Laufer (3) and E. Grün (1)

(1) MPI für Kernphysik, Heidelberg, Germany, (2) v. Hoerner und Sulger, Schwetzingen, Germany, (3) Stuttgart University, Germany

The moon is wrapped into an envelop of dust ejecta produced by impacts of meteoroids of either interplanetary or interstellar origin. Knowledge the spatial distribution of the ejecta allows to answer the old question whether the moon looses mass or not. Furthermore, the moon may be envisioned as a large area dust detector for the impactors. Thus, the spatial distribution of the dust in the vicinity of the moon also provides information about the relative contributions of the impactor sources to the total dust flux at the Earth orbit.

Here we introduce a dust detector designed to detect slow moon ejecta by means of the induced charges onto an array of electrode wires. This technique allows to determine the ejecta speed with 1and 10 km/s) and the particle's trajectory with about 1° accuracy. The detector has a sensitive area of about $0.1\mathrm{m}^2$ and can detect a wide range of particle sizes from 0.2μm to 100μm. Application of this detector is a lunar orbiter as currently discussed by several space agencies.