



## Lunar Dust Experiment (LDEX): First Results

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The lunar dust environment is expected to be dominated by submicron-sized dust particles released from the Moon due to the continual bombardment by micrometeoroids, and possibly due to UV radiation and plasma-induced near-surface intense electric fields. The Lunar Dust EXperiment (LDEX) instrument is designed to map the spatial and temporal variability of the dust size and density distributions in the lunar environment onboard the Lunar Atmosphere and Dust Environment Explorer (LADEE) mission [1, 2] orbiting the Moon since 10/6/2013. LDEX is an impact detector, capable of reliably detecting and measuring the mass of submicron and micron sized dust grains. LDEX also measures the collective currents from low-energy ions and from the impacts of dust grains that are below the detection threshold for single dust impacts; hence it can search for the putative population of grains with radii  $\sim 0.1 \mu\text{m}$  lofted over the terminator regions by plasma effects. This talk will summarize the preliminary analysis of the observations to date: 1) LDEX identified the dust ejecta cloud that is maintained by micrometeoroid bombardment. As predicted, the density of the dust ejecta cloud rapidly increases toward the surface, and it also shows strong temporal variability, most likely related to the stochastic nature of the meteoroid impacts. 2) LDEX, as of yet, has not confirmed the existence of levitated dust clouds. This puts strict new upper limits on the density of small lofted grains, especially during periods of low ion fluxes entering the instrument.

[1] Elphic *et al.*, *Proc. Lunar. Sci. Conf.* 44<sup>th</sup>, 1719 (2013)

[2] Horanyi *et al.*, *Proc. Lunar. Sci. Conf.* 43<sup>th</sup>, 1659 (2012).