

SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 1 (2A)

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MEASUREMENT RESULTS OF LUNAR DUST FROM CHANG'E-3

Abstract

Natural environmental factors and human activities can cause micro-perturbations, re-deposition and redistribution of lunar dust. Direct in situ measurements of the depositional mass of lunar dust and study its distributions are critical to understand the natural mechanisms of lunar dust transport. Here, we report on the newly aroused lunar dust depositional mass that was caused by the CE-3 Lander when it landed on the lunar surface, and we obtained in situ data of the naturally suspended lunar dust mass on the lunar surface by using the lunar dust detector (LDD) onboard Chang'E-3. The measured one-year-long data are generally in agreement with the previous analysis results from Apollo. However, we found: the lunar dust deposition during an entire lunar day was 40 times more than that of one lunar noon. We propose that this increased deposition occurs because the landing area of Chang'E-3 experienced the twilight time twice and the lunar dust redistributed under the effect of electrostatic forces, causing an increase in the observable deposition.