

## Design of an electron spectrum analyzer (PACE-ESA) on board the SELENE satellite

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ESA (Electron Spectrum Analyzer) is one of the sensors of PACE (Plasma energy Angle and Composition Experiments) on board the SELENE satellite. ESA is basically a top hat type electrostatic analyzer with angular scanning deflectors at the entrance and toroidal electrodes inside. Since SELENE satellite is a three-axis attitude controlled satellite, the three-dimensional electron distribution function is observed with two identical ESA sensors that has moonward and anti-moonward field of view, respectively.

PACE observes low energy electrons and ions around the moon. ESA's scientific goals are 1) measurement of lunar surface magnetic field strength by electron reflection method, 2) explication of Moon - Solar Wind Interaction (in particular, the structure of the lunar wake and the behavior of plasma near the limb of the moon), 3) survey of the Earth's magnetosphere at the lunar orbit, and so on. Of the three scientific goals shown above, 1) is the main target of ESA. Electron reflection method is as follows. With the existence of the remnant magnetic field on the moon, the electrons moving with large angle around the ambient magnetic field will be mirror reflected back to the satellite. Measuring the pitch angle distribution of the reflected electrons, the remnant magnetic field on the lunar surface can be deduced.

In order to decide the g-factor of ESA, we have analyzed the data obtained Electron Reflectometer (ER) on board Lunar Prospector (LP). LP is a lunar orbit satellite launched on Jan 6, 1998 by NASA. We have estimated the count rate of ESA using the solar wind electron flux, the flux reflected from the lunar surface, and the flux in the Earth's magnetotail.