



Global Mapping of Backscattered Energetic Neutral Hydrogen at the Moon: Observations from SARA/Chandrayaan-1

Audrey Schaufelberger (1), Peter Wurz (1), Stas Barabash (2), Martin Wieser (2), Yoshifumi Futaana (2), Mats Holmström (2), Anil Bhardwaj (3), M.B. Dhanya (3), R. Sridharan (3), and Kazushi Asamura (4)

(1) Physikalisches Institut, University of Bern, Bern, Switzerland (schaufelberger@space.unibe.ch), (2) Swedish Institute of Space Physics, Kiruna, Sweden, (3) Space Physics Laboratory, Vikram Sarabhai Space Center, Trivandrum, India, (4) Institute of Space and Astronautical Science, Sagami-hara, Japan

The Indian spacecraft Chandrayaan-1 carried the Sub-keV Atom Reflecting Analyzer (SARA) to investigate the solar wind - moon interaction by comparing impinging solar wind ions to energetic neutral atoms (ENAs) originating from the lunar surface. Solar wind backscattering contributes substantially to the observed signal, with up to 20% of the solar wind protons reflected as hydrogen ENAs. Angular resolution of SARA allows to create images or maps of the energetic neutral flux from the surface. Besides of pure geometrical effects like solar zenith angle, the intensity of the backscattered signal shows variations correlated to the location of the reflection point on the surface. Such variations are e.g. observed at local magnetic anomalies, which shield the surface from solar wind by forming a mini-magnetosphere under certain solar wind conditions (Futaana et al., Planet. Space Sci. 2006 and Wieser et al., GRL 2010). We report on global imaging of the features of lunar magnetic anomalies from a large dataset recorded by SARA. We compare the geometries of different lunar magnetic anomalies and discuss differences as well as similarities. We also discuss correlations between albedo features and ENA fluxes which are valuable for evaluating the space weathering effect by the solar wind protons.