



The possible influence of the Earth's magnetosphere on the formation of the lunar surface hydration

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Evidence of discoveries involved with lunar water (e.g., polar ice and $\text{OH}^-/\text{H}_2\text{O}$) has been observed in recent years. The dynamic H_2O loss and rehydration cycle over a lunar day indicated solar wind hydrogen should be an important source of lunar surface water. In this study, we investigate the influence of the Earth's magnetosphere on the formation of the lunar surface hydration. Based on Moon Mineralogy Mapper (M^3) data onboard Chandrayaan-1, we perform a statistical study of the lunar hydration distribution at high latitude regions. The lunar surface hydration is closely related to the solar illumination condition, indicating higher abundance varies with the lunar terminator which is consistent with the Deep Impact observation. When the Moon enters into the Earth's magnetosphere, the lunar surface hydration can also be formed and the magnitudes are of the same order inside/outside magnetotail. Nevertheless, further work needs to be done to study the physical mechanism.