



The lunar tide observed in Earth's magnetosphere

Quanqi Shi¹, Chao Xiao², et al.

¹ Institute of Space Science, Shandong University
e-mail (speaker): sqq@sdu.edu.cn

Abstract : Tides are universal and affect spatially distributed systems, ranging from planetary to galactic scales. In the Earth–Moon system, effects caused by lunar tides were previously reported in the Earth's crust, oceans, neutral gas-dominated atmosphere (including the ionosphere) and near-ground geomagnetic field. However, whether a lunar tide effect exists in the plasma-dominated regions such as the magnetosphere has not been explored yet. Here we show observational evidence of a lunar tide-induced signal in the plasmasphere and other regions in the magnetosphere. The signal possesses distinct monthly periodicities at the plasmopause, which are different from the semimonthly variations dominant in the previously observed lunar tide effects in other regions such as those in the ocean. Where and how this electric field is generated also has been discussed.