MHD Predictions of Plasma Conditions Above Insight Landing Site based on MAVEN observations

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The Interior Exploration using Seismic Investigations, Geodesy and Heat Transport (InSight) mission was launched on 5 May 2018 and successfully landed at Elysium Planitia (4.5°N, 135.9°E) on Mars on 26 November 2018. The InSight Lander carries a magnetometer to measure disturbances from the Martian ionosphere. In order to understand the daily variations in the magnet field measurements on Martian surface, in this study, we use the time-dependent MHD model to study how plasma conditions vary with local time above insight landing site using solar wind condition from MAVEN observation. Significant diurnal variations can be seen in all plasma quantities due to solar wind interactions and planetary rotation. The induced magnetic field is mainly in the same direction as the upstream IMF. However, it seems that the variations seen by the Insight magnetometer cannot be only due to the interaction of the solar wind. We also add a neutral wind effect in our simulations to further investigate possible causes of surface field changes.