[EJ] Evening Poster | P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS07]Mars and Mars system: results from a broad spectrum of Mars studies and aspects for future missions

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Unprecedented progress in being made in our understanding of the planet Mars, especially because of new data from the US, European, Russian, and Asian missions to Mars. Eight spacecraft are currently operating at Mars, with six in orbit (Odyssey, MRO, MAVEN, Mars Express, Mangalyaan and TGO) and two on the surface (MSL-Curiosity and MER-Opportunity), the largest number ever at any given time. In addition InSight Lander is on track for launch in 2018, and Mars 2020, ExoMars and the Emirates Mars Mission in 2020. All this is a clear demonstration of public's strong fascination with and commitment to Mars exploration and the resulting scientific bonanza. Synergistic investigations with ongoing or already completed missions along with modeling studies and earth-based observations are gradually revealing the nature of Earth's most closely resembling planet that took on a different evolutionary track. Morphology and variable phenomena seen on the surface (RSLs, for example) indicate the red planet may possibly be still active, and require a clear understanding of its current geologic and atmospheric state, climate evolution and habitability. Thus, this session is planned to discuss recent results from a broad spectrum of Mars studies encompassing the interior, surface, atmosphere, plasma environment, and the Mars system including its two satellites. Abstracts on instrumentation and future mission plans are also encouraged for this session, as both the presenters and the audience would greatly benefit from ensuing discussions and feedbacks.

[PPS07-P10]On the Navigation of the Lunar Probe with the Starlight Angle Obs.

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Keywords:celestial navigation, starlight angle, lunar probe, Kalman filtering

Celestial navigation is a method of autonomous navigation without relying on the remote control of ground stations. In this article, first, the observation equation of celestial navigation of the lunar probe based on observations of the starlight angle is established. Next, a systematic state equation is established according to motion model of the lunar probe, then the model of celestial navigation by extending the method achieved by Kalman filtering. At last, a transfer orbit of the lunar probe from the Earth to the Moon is simulated and the simulation result is analyzed.

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