[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-P03]Zonal correlation among dust, water ice clouds and temperature in the Marian atmosphere observed by MRO-MCS

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We studied the zonal correlation among dust opacity, water ice cloud opacity and air temperature observed by Mars Climate Sounder (MCS) onboard Mars Reconnaissance Orbiter (MRO). Since the MCS data provided from the NASA Planetary Data System are a huge number (> 1,000,000) of original vertical profiles of atmospheric physical properties measured along the MRO orbit, it was not easy to use them for analyses of the global-scale spatial/temporal structure of the Martian atmosphere. Therefore, we performed a 4D gridding on the data and adopted a visualization method proposed by Noguchi and Hayashi [2017], which utilized Grid Analysis and Display System (GrADS), to understand the planetary-scale variability of the Martian atmosphere.

Our previous analysis showed that the water ice cloud opacity around Hellas Planitia (30-60S, 50-100E) decreased during late autumn and early spring in the southern hemisphere (Ls=70-110 deg), and temperature and the dust opacity in the same region increased simultaneously: a negative correlation between dust and water ice clouds was found. We interpreted the results as the heatup which was caused by dust and the subsequent sublimation of water ice clouds. However, we have also found a positive correlation between dust and water ice clouds in a different region, which suggests that the increase of dust induced the

increase of condensation nucleus and promoted the formation of water ice clouds in that area.