

## Variation of Martian dust distribution in the summer south polar region

# Yuko Ito[1]; Takeshi Imamura[2]; Masato Nakamura[2]

[1] Earth and Planetary Sci., Univ. of Tokyo; [2] ISAS/JAXA

Atmospheric dust affects the structure and dynamics of the martian atmosphere by absorbing solar radiation and thermal radiation. Atmospheric dust tends to increase globally from the spring to summer of the southern hemisphere; the mechanism of dust lifting in this season needs to be clarified. Thus we focused on the fact that local dust storms frequently occur along the edge of the southern polar cap in this season, and addressed the variation of dust opacity in this region and period.

Using the dust opacity and atmospheric temperature data taken by the Mars Global Surveyor Thermal Emission Spectrometer (MGS/TES), we made Hovmoeller diagrams and analyzed how dust distribution changes with time at each latitude band. In the results we discovered phenomena in southern summer that dust opacity increases every 10-20 days at 70-80S, 180-270E and subsequently the dust clouds migrate westward at a velocity of about 3 m/s.

This phenomenon might be divided into two steps that firstly dust is lifted up quasi-periodically near 180-270E and then transported westward by winds. The dust lifting is possibly induced by vertical or horizontal convection. The analysis showed that the variation of atmospheric dust affects the vertical stability, although the feedback from the vertical stability to dust lifting was not observed. Near the edge of the polar cap, it is possible that strong thermal gradient causes horizontal convection. Polar cap edge exists in the region and time where the quasi-periodic dust lifting was observed, although the mechanism of the quasi-periodicity is not explained. The westward migration of dust clouds suggests the presence of weak westward winds near the surfaces in southern summer.