EPSC Abstracts,
Vol. 2, EPSC2007-A-00434, 2007
European Planetary Science Congress 2007

Seasonal variation of temperature structure and aerosol in Martian atmosphere from PFS MEX data

L. Zasova (1), V. Formisano (2)

(1) IKI RAS, Moscow, Russia, (2) IFSI INAF, Rome, Italy (zasova@iki.rssi.ru /phone +7-495-333-34-66)

We review the results obtained from Long Wavelength Channel (7 - 35 μm) of Planetary Fourier Spectrometer. We compare a behavior of temperature and aerosol opacity (dust and ice clouds) in the areas of Tharsis Volcanoes , Hellas and in Vales Marineris. In Vales Marineris the water ice fog was found in the morning around 10h with opacity of 0.1 - 0.3 (at 825 cm-1) and typical particle size 2-4 μm at Ls=24 deg. (3-13S, 286E). A surface temperature was found about 10K lower than outside of Vales Marineris and it remained lower up to 20 km altitude. In the same area in Vales Marineris the observation at LS=135 deg, LT=13h showed the dust storm with the opacity of about 1 of silicate dust, typical for Martian dust storms. Dust opacity was found maximal above the Vales Marineris and lower outside.

Another example is observation at LS = 38 deg (13-15S, 302E) of the morning fog (also at 10h). This time the fog was observed simultaneously by OMEGA and HRSC. From PFS LWC the opacity was estimated to be about 0.2. The shape of spectra shows that this fog may be made of water ice with mean particle radius exceeding 4 μm. The second possibility is that it is a mixture of dust and ice particles or (the third possibility) dust particles covered by ice. It is not possible to differ between these cases from LWC PFS spectra. The fourth (less probable) possibility that it is non silicate dust (never observed before). Both areas considered are separated by 16 deg. of longitude and in principle it is possible to find dust of different composition there.

L.Zasova acknowledges the Russian Foundation of Basic Research for financial support, grant 07-02-00850.