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MODELING INFRARED THERMAL EMISSIONS ON MARS DURING DUST STORM OF MY28: PFS/MEX OBSERVATION

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We have analysed thermal emission spectra obtained from Planetary Fourier Spectrometer (PFS) onboard Mars Express (MEX) for Martian Year (MY) 28 in presence and absence of dust storm at low latitude. A radiative transfer model for dusty atmosphere of Mars is developed to estimate the thermal emission spectra at latitude range 0-10oS, 10-20oS and 20-30oS. These calculations are made at $L_s=240^{\circ}$, 280° , 300° , and 320° between wave numbers 250-1400 cm^{-1} . We have also retrieved brightness temperatures from thermal emission spectra by inverting the Planck function. The model reproduces the observed features at wave numbers 600-750 cm^{-1} and 900-1200 cm^{-1} due to absorptions by CO_2 and dust respectively. In presence of dust storm thermal emission spectra and brightness temperature are reduced by a factor of 2 between wave numbers 900-1200 cm^{-1} . The altitude profiles of dust concentration are also estimated for different aerosol particles of sizes 0.2 to 3 μm . The best fit to the PFS measurements is obtained in presence of aerosol particle of size 0.2 μm .