Nadir infrared measurements with SPICAM experiment on Mars-Express

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The SPICAM IR spectrometer (1.0-1.7 μm, resolution 0.5-1.2 nm, mass 0.7 kg) is dedicated primarily to nadir measurements of H_2O abundances simultaneously with ozone measured in the UV, for a better description and understanding of the chemical coupling H_2O-O_3. The IR channel of SPICAM is a separate spectrometer integrated in SPICAM along with the UV spectrometer. We present the overview of the scientific results obtained in nadir mapping mode from January 2004 (L_s=330˚) to November 2005 (L_s=331˚) covering the entire Martian year. The seasonal trend of water vapor measured by SPICAM IR is consistent with TES results and reveals disagreement with MAWD results related to South Pole maximum. The main feature of SPICAM measurements is globally smaller water vapor abundance for all seasons and locations including polar regions, if compared to TES. The maximum abundance is 50-55 precipitable microns at the North Pole and 10-15 pr. microns at the South Pole. The northern tropical maximum amounts to 10-15 pr. microns. Possible reasons for the disagreements are discussed. Oxygen dayglow $O_2(a^1\Delta_g)$ is a result of photodissociation of ozone in the Martian atmosphere. The IR SPICAM allows to observe ozone from O_2 emission at 1.27 μm simultaneously with H_2O. We present the first seasonal map of O_2 emission. Maximal values of O_2 emission are observed during late winter to early spring at high latitudes in both hemispheres. Other results of the SPICAM IR measurements, such as maps of H_2O and CO_2 ices will be presented.