



Observations of Carbon Monoxide in the Martian Atmosphere - the comparison of the measurements done by SW PFSMEX and HIFI on Herschel in the period 11-16 of April 2010

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We report the analysis of *Herschel*/HIFI and *PFS*/MEX observations of the Martian atmosphere performed between 11 and 16 of April 2010.

From HIFI observations we selected the (7-6) rotational transitions of the isotopes ^{13}CO and C^{18}O at 771 and 768 GHz respectively in order to retrieve the mean volume mixing ratio of carbon monoxide.

The Planetary Fourier Spectrometer (PFS) an instrument optimized for atmospheric studies covers the spectral range from 1.2 to $45\mu\text{m}$ and consist of two channels: the Short Wavelength Channel (SW), which measures the reflected light from the planet, and the Long Wavelength Channel (LW), which is sensitive to the emitted light from the planet surface. In this work we present the result of CO concentration in the Mars atmosphere using spectra acquired by the PFS SW channel. To reach a good signal we excluded the instrumental effects in spectra and the mean spectra were build. We have retrieved CO mixing ratios at 4235cm^{-1} band from some mean spectra of orbits 8039, 8040 and 8049.

The spectral bands and lines observed by both instruments have been modeled using a radiative transfer code: Mars was assumed as a sphere surrounded by a concentric atmospheric layers. Within each layer the atmospheric temperature, pressure and volume mixing ratio have been assumed constant. The surface continuum emission was modeled as a blackbody emission with temperatures depend on geometry.

The carbon monoxide mixing ratio from HIFI data was determined to be 980 ± 150 ppm from PFS SW is situated in the range about 400-1600 ppm with the error about 20%.

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References: G. Sindoni, V. Formisano, A. Geminale, Observations of water vapour and carbon monoxide in the Martian atmosphere with the SWC of PFS/MEX, in press PSS 2011

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