LINE BROADENING PARAMETERS OF METHANE AT 6000 CM^{-1}

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Being one of the most important greenhouse gases, methane (CH_4) is also modified by anthropogenic activity. Nowadays, it can be monitored globally from space on the long-term scale using combinations of different remote sensing instruments. The critical point for the retrieval algorithms is the knowledge of the spectroscopic parameters. Although a significant amount of spectroscopic data on CH_4 is available, the information on the line parameters in mid infrared (MIR) spectral region is inadequate for accurate remote sensing applications and there is a need for improved spectroscopic line parameters.

We report on the improved spectroscopic line parameters for CH_4 in the spectral regions used by SCIAMACHY and TANSO instruments around 6000 cm^{-1}.

New data were obtained using high resolution absorption spectra of CH_4, perturbed by oxygen, nitrogen and air. Spectra were measured using Fourier transform spectrometer in a broad range of total pressures from 2 to 1000 mbar and temperatures down to 196 K. Calculations of broadening parameters were performed using Reference Forward Model assuming Voigt line profile within international collaboration between the Molecular Spectroscopy Laboratory in IUP Bremen, and Earth Observation Science Group, University of Leicester, UK.

Accuracy of the new data matches the level of the demands of modern datasets and remote sensing. The new data were compared with the data included in the latest HITRAN edition and other published works. Before release for the general scientific community, the new data was tested on the TANSO and SCIAMACHY retrievals.