OBSERVATION AND ANALYSIS OF THE WATER ABSORPTION SPECTRUM FROM NEAR IR TO NEAR UV REGION

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In the region extending from near IR to UV, the spectral composition of the solar radiation that reaches the surface of the Earth is mainly determined by the absorption of water vapor. It is important, therefore , to know the line positions of water in this region for modelling purposes. A large fraction of the lines (up to one third) observed previously in this region has remained unassigned for more than a decade. Recently we have assigned virtually all of the unassigned lines in the region up to 16 000 cm^{-1}.

We report here the obsevation of the water vapor lines in the region between 10 000 cm^{-1} and 25 000 cm^{-1}. Using the 50 m baselength multiple reflection cell of the Universite de Reims optically coupled to the BRUKER IFS120M Fourier transform spectrometer of the Universite Libre de Bruxelles, the H_2O absorption spectrum has been recorded at high resolution at room temperature. Absorption path was 600m and water pressure variing from 1.1 to 15 torr.

In average about twice as many lines as reported earlier were recorded. We present here the results of the analysis of these lines. Thousands of newly assigned lines belonging to the known bands as well as lines from newly observed vibrational states are presented. Altogether the energy levels of more than 15 new vibrational states of water were derived.