Master thesis Environmental Physics

Atmospheric spectroscopy of Water Vapor by ground based Fourier Transform infrared (FTIR) spectrometry.

Water vapor plays an important role in the atmospheric physics and chemistry. It is the most abundant trace gas in the troposphere and determines the weather as well as influences the climate via its radiative properties. Water vapor is the most important greenhouse gases.

Using the sun as the light source FTIR spectroscopy is used to record absorption spectra of atmospheric trace gases. Analyzing the absorptions of the atmospheric molecules it is possible to determine the vertical column as well as vertical profiles. FTIR spectrometry is a well established technique and the only ground-based remote sensing technique, which is able to determine water vapor profiles in the troposphere.

In the master thesis, an existing program, sfit2, to retrieve information about water from FTIR spectra will be modified in order to accommodate for specific spectroscopic properties of water vapor. Atmospheric absorption spectra are available since 1992. The water vapour retrieval will be tested and applied to these spectra.

The program sfit2 has been written in **Fortran.** The extension will be written in **Fortran 95.** Learning and using this computer language is part of the work on the thesis.

In order to complete this thesis you should:

- be interested in Atmospheric Physics
- be interested in spectroscopy of the atmosphere
- be willing to learn and use Fortran 95

In order to learn more about this topic, please do not hesitate to contact:

Dr. Mathias Palm	0421 218 4419 mathias@iup.physik.uni-bremen.de
Dr. Thorsten Warneke	0421 218 8617 warneke@iup.physik.uni-bremen.de
Prof. Justus Notholt	0421 218 8982 notholt@uni-bremen.de