Monthly report / October 2009

WP 3100: Raman scattering

Further testing of the aerosol and cloudy cases has been performed. During development and testing of the Raman scattering option various flags were introduced into the code for turning various features on and off. Some of these flags were only in effect when aerosol and clouds were included. The right setting of these flags have resolved the aerosol and cloud issue.

Status: closed

WP 3200: Polarization in 3D atmosphere

The database of optical properties for liquid water clouds has been calculated for the thermal spectral range. This means that WP 3200 is now complete.

Status: closed

WP 3300: Extension of surface properties

Polarization by surface reflection has been included into MYSTIC so that arbitrary reflectance matrices can be handled.
A program by Mishchenko (1997) (freely availabe at
http://www.giss.nasa.gov/staff/mmishchenko/brf/) has been integrated to compute the reflectance matrix for rough water surfaces. This program is based on the Fresnel equations, on Cox and Munk (1954) to describe the wind-speed dependent slope of the waves, and on Tsang et al. (1985) to account for shadowing effects.

Status: closed

WP 4210: Verification

Raman scattering:

Verification of the cloudless cases have ended. The present implementation of Raman scattering agrees with the published results in so far as input parameters are known.

The Raman option agrees well with the aerosol results of Langford et al (2007) and for the tested cloud case of Spurr et al. (2008), their Figure 3. Further cloud tests are ongoing.

A comparison have been made with surface based UV irradiance measurements made by Prof. M. Blumthaler, Univ. of Innsbruck, for aerosol cases. Accurate wavelength alignment of the measured spectra are needed to calculate the filling-in. So far this have only been successfully achieved with one spectrum. This has been compared with model simulations and the agreement is good.

Polarization, spherical geometry and refraction:

A model intercomparison study for models that handle polarization in spherical geometry has been started in cooperation with the University of Bremen. The test cases include different geometries (corresponding to SCIAMACHY scans) and different wavelengths. For this study only Rayleigh scattering is considered since limb sounding does not make much sense in presence of clouds. The test cases will be computed with and without refraction.

Status: ongoing

WP 4220: Verification report

The verification report is currently being written.

Status: ongoing

WP 5100: Documentation

Writing of final ATBDs in progress.

Status: ongoing