

*Monthly report / July 2008*

WP 2100: Derive technical specification of toolbox

The freely available line-by-line models ARTS and genln-2 have been compared. Generally there is a good agreement between the absorption coefficients of the models provided that the same spectral database is used and the same continuum models. ARTS provides up-to-date continuum models (which can be specified by the user) and it can be used with all HITRAN databases from 1996 to 2004. The ARTS model has successfully been coupled with libRadtran via a python interface that generates from the ARTS output (absorption coefficients) the required libRadtran input. It seems to be a good option to use ARTS as line-by-line tool for libRadtran. Some more testing, especially with respect to computation time, is required.

The libRadtran/ARTS line-by-line calculations have been validated against broadband IR measurements in the atmospheric window from 8 to 14 micrometer taken in Davos. We found a very good agreement between the line-by-line calculations and the observations. Simulations using the LOWTRAN band model were significantly lower than the measurements.

WP 2200: Preliminary Algorithm Theoretical Basis Documents

The ATBD documents for the implementation of Raman scattering and polarization in the 3D Monte Carlo radiative transfer solver MYSTIC are still in preparation.

General libRadtran development:

To improve user friendliness of the model, the user input to simulate liquid and ice clouds using different parameterizations has been made more consistent.

The implementation of the polradtran solver has been validated against benchmark results by Coulson et al., 1960.

We started to build a complete MYSTIC testsuite which compares MYSTIC and disort for all possible combinations of input conditions. So far there are 50 individual tests.

*Status:*

WP 2100: ongoing

WP 2200: ongoing

WP 2300: not yet started