

## ***Observed and modelled long-term cloud statistics for the Murg valley***

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For the supersite M, a continuous long-term data set of temperature, humidity and liquid water content profiles has been compiled for the time from April to December 2007 using the Integrated Profiling Technique (IPT, Löhnert et al., 2004, 2006). This technique combines in a Bayesian based approach multiple measurements of active and passive remote sensing instruments for various wavelengths, i.e. ground-based microwave radiometer, cloud radar and ceilometer, with a priori information from radiosondes. The IPT also employs the Cloudnet Target Classification product to distinguish between cloudy and cloud-free regions. One advantage of the IPT is the physical consistency of the derived profiles with the cloud radar and microwave radiometer measurements. In addition to the atmospheric profiles, estimates of corresponding errors are derived which allow for a meaningful interpretation of the results.

This long-term data set is subsequently used to investigate the long-term statistics of water clouds for the AMF site in the Murg valley, e.g. the frequency of occurrence, number of cloud layers, distribution of liquid water content. Furthermore, the cloud statistics are compared on the one hand to results of simple cloud models, e.g. the Salonen cloud model (Mattioli et al., 2006), which are frequently used for the simulation of cloud attenuation, and on the other hand to single-column output of the numerical weather prediction model COSMO-DE. We want to address the question how well clouds are represented in these models. In particular, we observe strong deviations of the results of simple cloud attenuation models from those obtained by the IPT and COSMO-DE.