



Independent estimation of attenuation and rain water content by passive and active multi-frequency sensors

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Rain water content is an important parameter for the characterization of precipitating clouds, however its estimation might be significantly affected by unknowns on the drop size distribution and attenuation. The latest might be estimated for the rain layer by means of radar polarimetric methods. On the other hand, the passive microwave radiometer ADMIRARI is able to retrieve rain and cloud integrated water content as well as path integrated attenuation simultaneously at three frequencies (10.7, 21.0 and 36.5 GHz).

Since last year the Jülich Research Center in Germany has become a test-bed for multi sensor observations, with a X-band polarimetric radar and the radiometer ADMIRARI as a main instrumental suit. This allows to have a synergistic observation of rain events at the radiometer's field of view.

In this work, independent methods to estimate attenuation are validated and its corresponding uncertainties will be put into consideration. This study pave the way to develop an optimal estimation theory framework for a foresee passive and active retrieval approach. Its application on rain measurements collected at the Global Precipitation Measurement (GPM) Ground Validation field campaigns will also be presented.