



A sharper view of fuzzy objects: Synergistic use of A-Train measurements to study warm clouds

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Clouds are arguably one of the most important factors modulating the earth's energy balance. Yet, our understanding of cloud forcings and potential feedbacks is still poor. Satellite data provide the only means to globally observe cloud properties. Significant progress has been made in the field of satellite remote sensing over the last decade. In particular, the A-Train constellation has become an invaluable tool to study clouds and cloud processes. It provides the unprecedented opportunity to nearly simultaneously observe clouds from active and passive instruments spanning the entire range from the visible to the microwave part of the electromagnetic spectrum. The synergistic use of these different measurements helps to significantly narrow down uncertainties in retrieved cloud properties and allows for the derivation of new parameters that could not be derived from one instrument alone.

This presentation will focus on three new products and related climatologies developed in our group: cloud droplet number concentration, cloud liquid water path, and rain water path. The role of these datasets in climate research will be discussed and application examples both at the cloud process level as well as the climate system level will be given.