PrePEP 2025

Conference on Precipitation Processes – Estimation and Prediction

Title: Microphysical fingerprinting in multi-peaked radar Doppler spectra

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Duration: 9 am - 5 pm including breaks

Format: in-person only

Location: Dept. of Meteorology, Auf dem Hügel 20, 53121 Bonn

Abstract:
Cloud and precipitation processes are still a main source for uncertainties in weather prediction and climate change projections. Doppler spectra of polarimetric radars provide a wealth of information on microphysical processes, but multi-peaked situations are still challenging to analyze, especially on a large scale. This short course gives insights in fingerprints of microphysical processes inherent in polarimetric radar observations and how this information can be extracted with the peako and peakTree toolkits, including a hands-on part. Using example datasets from recent campaigns, the attendees will learn how to find the optimum parameters for the peak finding algorithm, how these parameters are then used to transfer the Doppler spectrum into a binary tree of radar moments, and how this data structure can be used to gain insights into microphysical processes.

Learning objectives:

- Gain understanding how microphysical processes are show up in radar Doppler spectra
- Use peako and peakTree to analyze a case study from a provided dataset
- Get an impression about the limitations of the analysis

Technical requirement:

- Computer with the possibility to install python packages, including one that require compiled libraries (e.g. numpy, scipy, xarray and others)

Prior knowledge required from participants:

- Basic understanding of cloud radar observations and prior experience with Python

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