Seamless classification of hydrometeors using a multi-sensor approach (SeaClaMH)

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1 PostDoc

Overview

- Proposal
- Instrumentation & Measurement strategy
- Goal

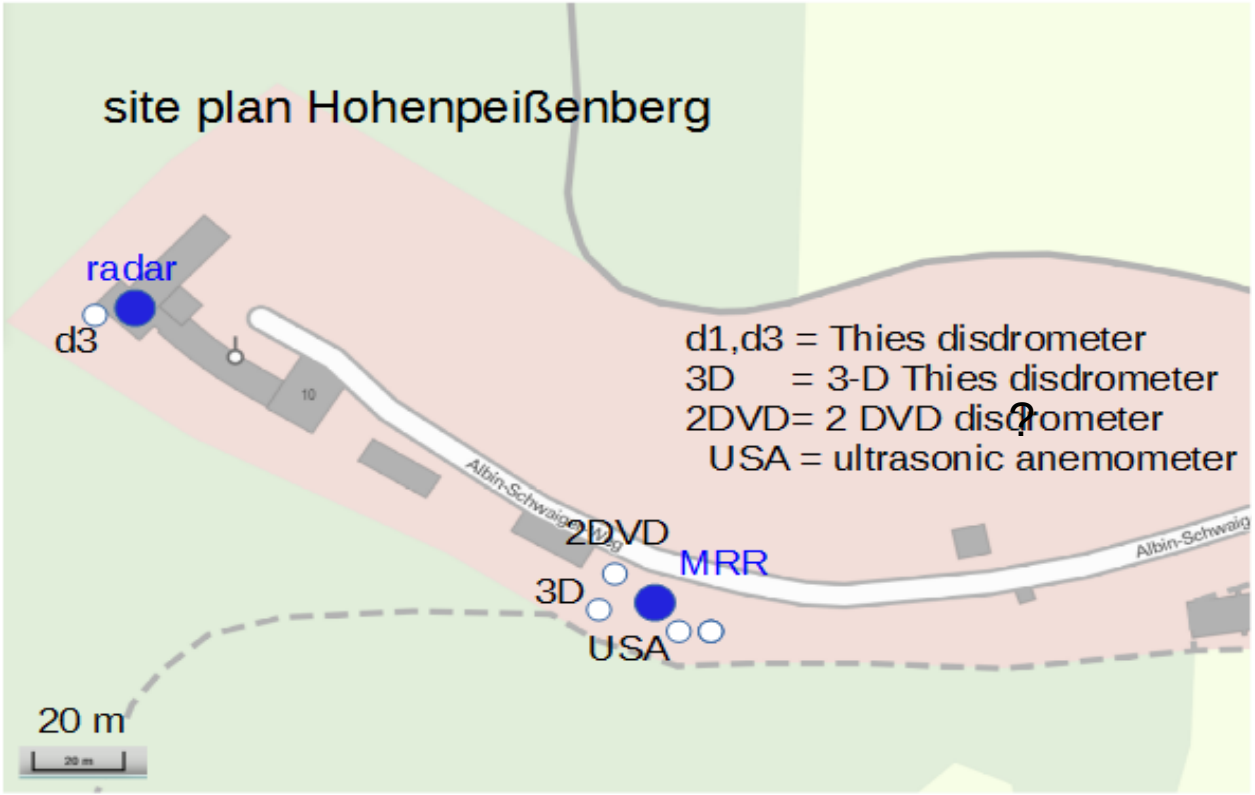
Core idea

Classify the mixed phased precipitation process in a column of high vertical and temporal resolution.

Use of polarimetric fingerprints and Doppler data / spectra.

- employ birdbath data, use QVP concept, MRR & surface based observations (disdrometer)
- test setup @ reasearch radar Hohenpeißenberg.
- Envisioned product: high-resolution columns of precip-Classification @ 17 radar sites.
- The set-up is chosen that it fits into the operational scan schedule.
- Test of Myagkov approach (collaboration with TROPOS)

Set up


site plan Hohenpeißenberg
radar
d3
d1,d3 = Thies disdrometer
3D = 3-D Thies disdrometer
2DVD= 2 DVD disdrometer
USA = ultrasonic anemometer
2DVD
MRR
3D
USA
20 m

Sampling strategy

Important aspect to this project: approach can be transfered into an operational application, it must fit into the DWD scan strategy,

Current status:

Initial data acquisition is already implemented into the operational data scan schedule (Hohenpeißenberg; easily transferable to the other radar sites):

Scan sequence:

operational 25° elevation sweep (range resolution 1000 km)
followed by 25° elevation sweep (range resolution 25 m – oversampling)
followed by 90° birdath

all sweeps within less than ~ 1 minute, repeated every 5 minutes.

New: make extensive use of Doppler information.
Doppler spectra can now be safed in hdf5 -> possible operational data stream

Verification concept

Verification of classification results:

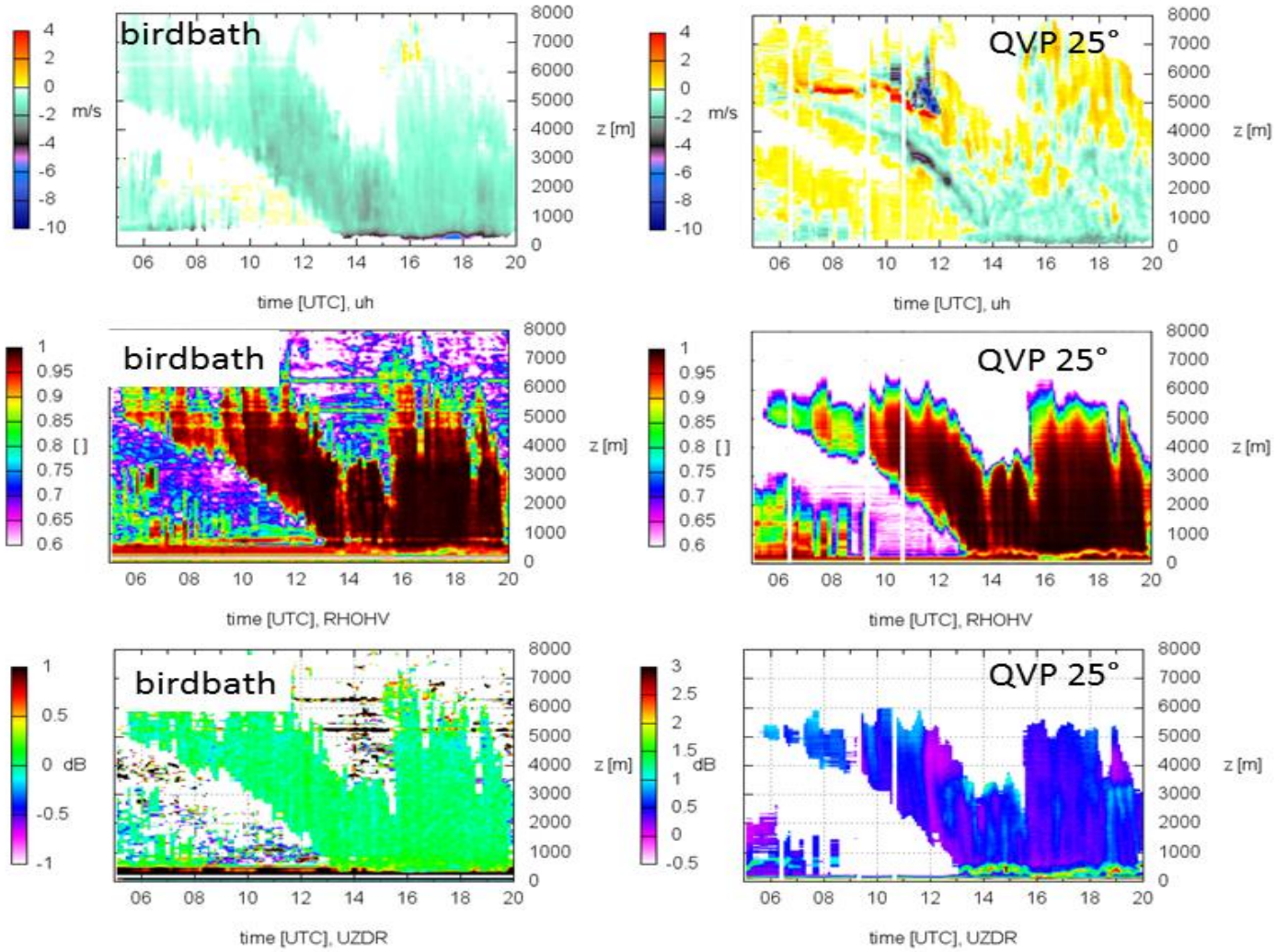
select orographic precipitation events where the melting layer descents on and below the Hohenpeißenberg site (see e.g. Frech and Steinert, 2015)

- insitu observations (observers & distrometers) are used to verify upstream radar based classification of the precipitation process.

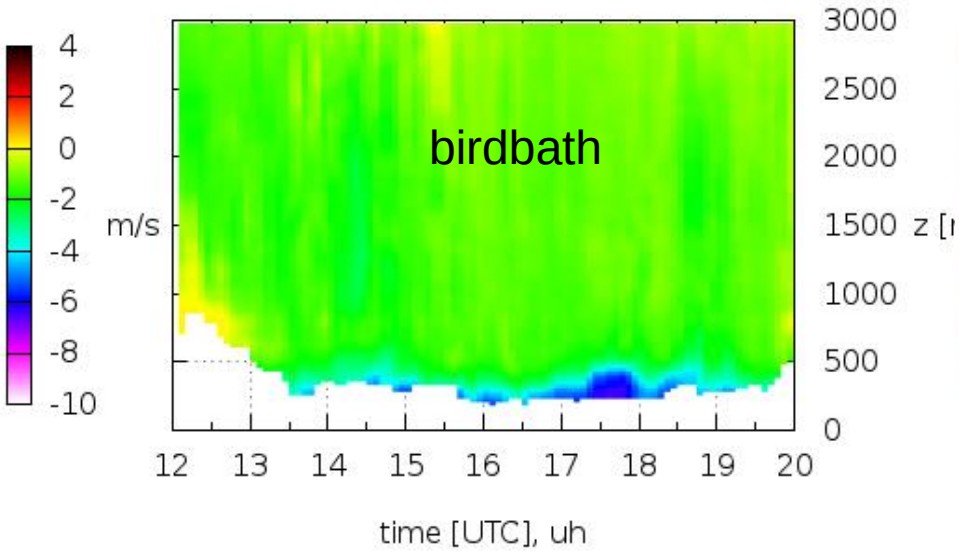
We have the option to set-up a 2DVD distrometer: decision to install a 2DVD will be based on the background of the to-be-hired PostDoc.

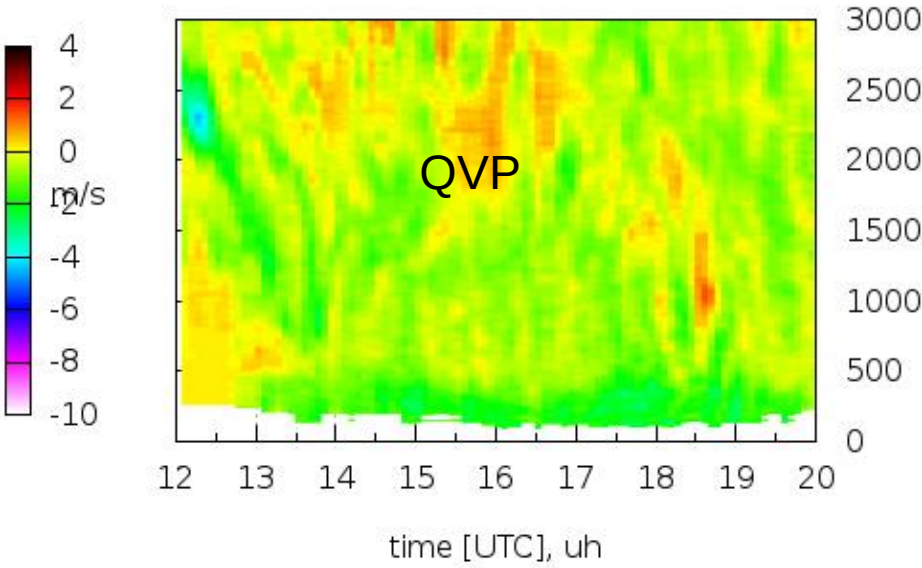
External collaboration: Valery Melnikov (NOAA/NSSL)

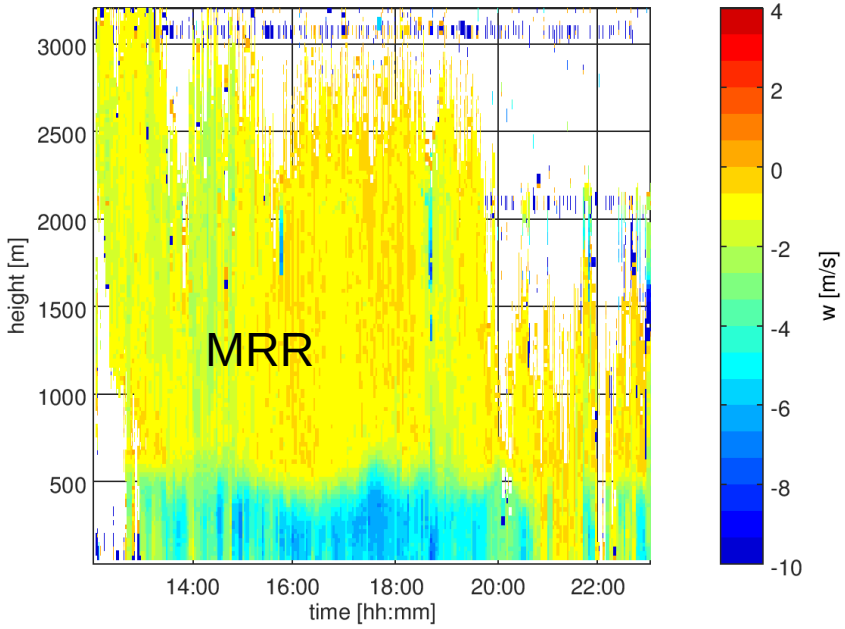
QVP & Birdbath



Doppler data







MRR fills the gap between between disdrometer and first „good“ rangebin

Data portal (1)

Proposal title:

„Effective use of three-dimensional polarimetric radar network data“

Two WPs are proposed:

WP1: Development of a radar data portal

- development of web-based data portal for SPROM
- implementation as a routine service

WP2: Analyses of 3-D – radar data derived parameter

- classification of radar data
- goal is the classification of radar data in terms of meteorological classifiers (i.e. stratiform, convective, cold/warm front, winter weather…)

Data portal (2)

DWD asked for 1 PostDoc: awarded were 0.5.

- Status: currently try to secure DWD money to fund a full position
- Decision expected by the end of November.
- If there is no additional funding by DWD, DWD will withdraw from this task

Fallback:

in order to manage the data requests, SPROM is asked to concentrate on specific episodes, i.e. X days radar data from a convective and stratiform case.

If funding can be secured:

- Start of work expected 2nd quarter 2019
- delay is likey to be not critical, as main usage radar data is expected in the 2nd phase of the project