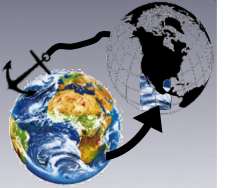


The background of the slide is a weather map of Europe. It features a grid of latitude and longitude lines. Precipitation intensity is shown with a color scale from green (light) to yellow and orange (heavy). Several weather systems are labeled with letters: 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'K', 'M', 'N', 'S', 'W', and 'WS'. Numerical values like 47, 48, 49, 50, 51, 52, 53, and 54 are also visible on the map.

Lagrange precipitation verification

Diploma thesis by Nicole Feiertag



- Reminder (Motivation, Method)
- Data
- Sensitivity Study
- Results
- Outlook

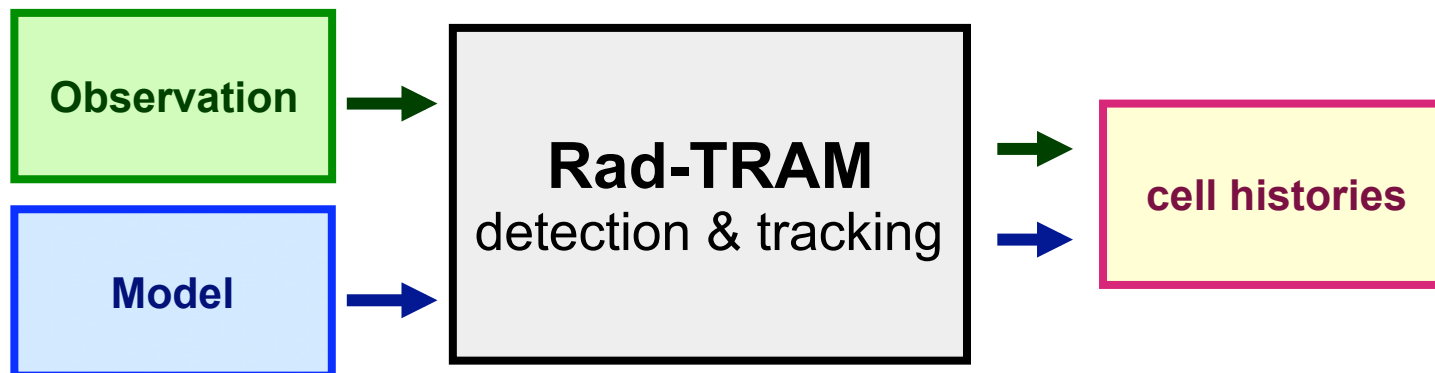


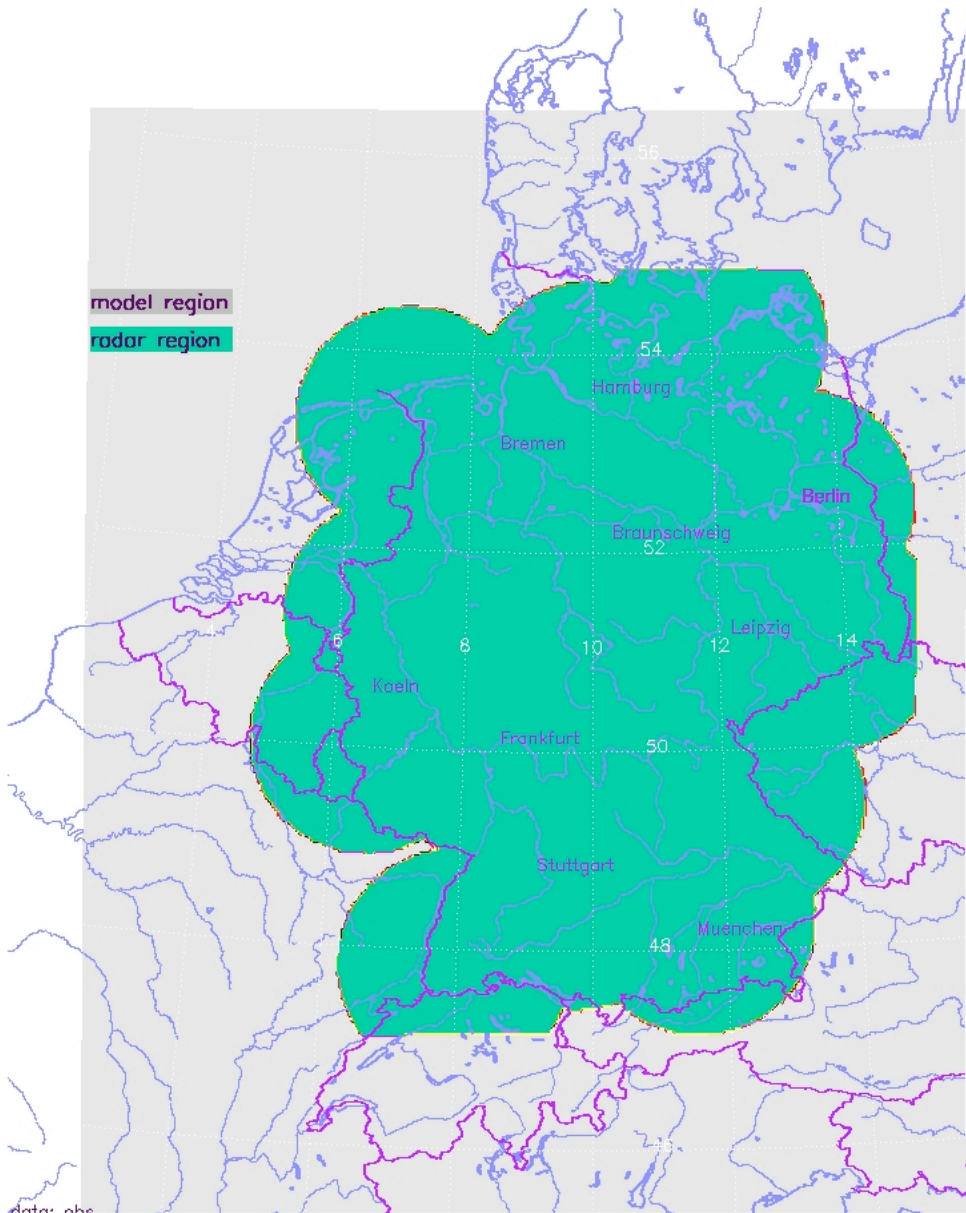
Motivation:

- With a grid-spacing of 2.8 km, COSMO-DE resolves deep convection
- How precise can the model predict the characteristics of convective cells?
→ life time; size distribution; location initiation; tracks ...

Method:

- Tracking and nowcasting algorithm Rad-TRAM written at the DLR to find the cell characteristics
 - needs a threshold for cell detection

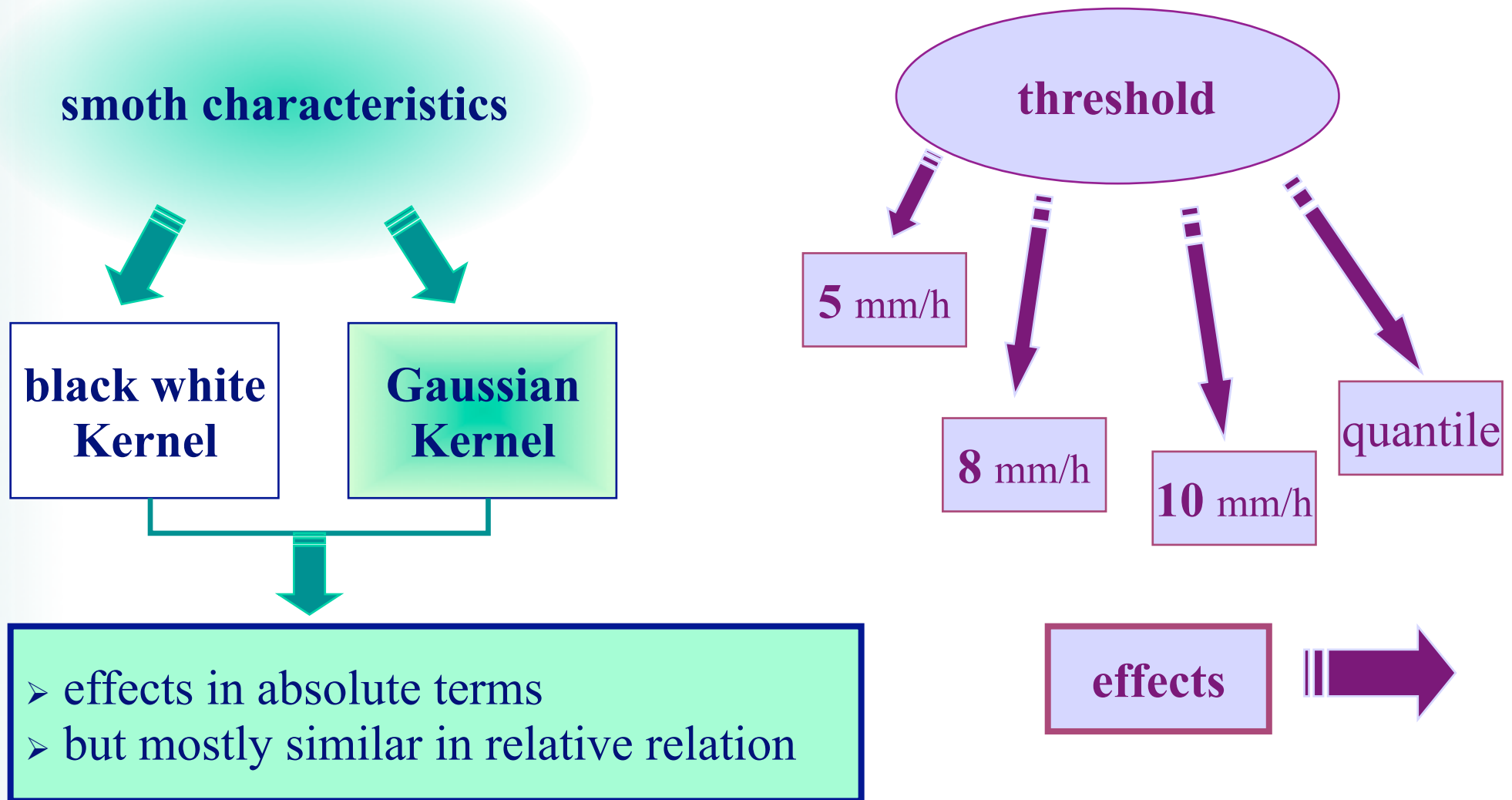


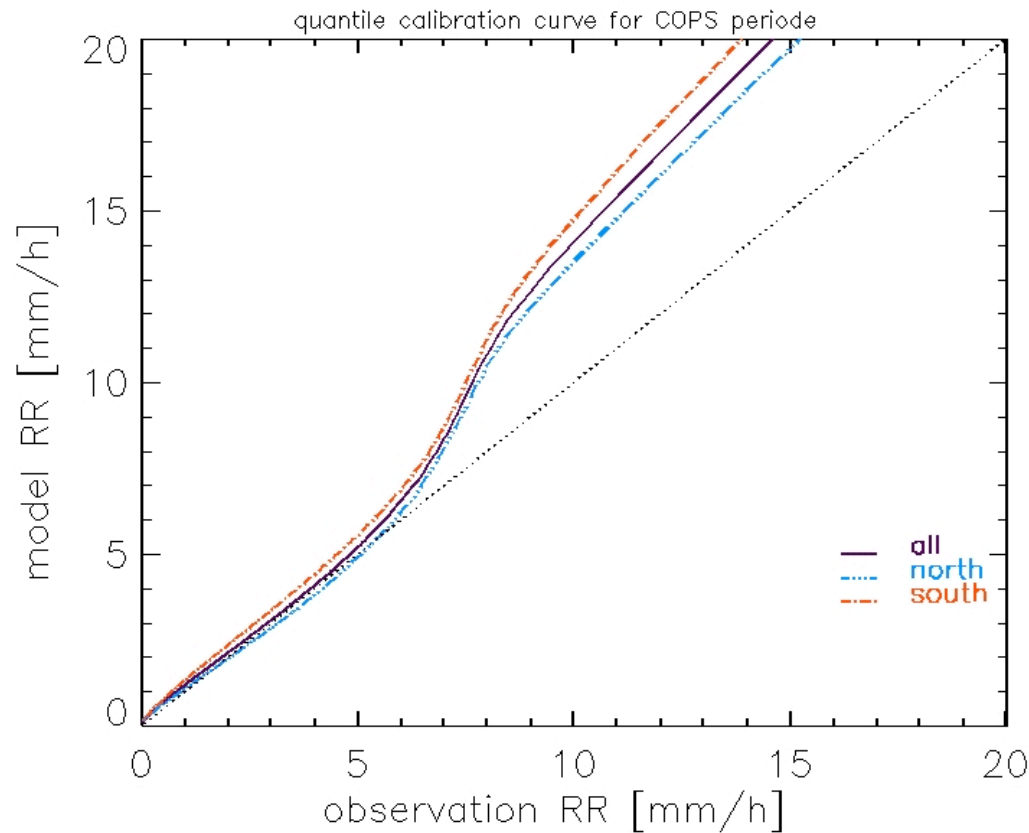
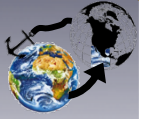


- COPS period
(02.06.-31.08.2007)
- Observation:
GOP (RY by DWD)
- Model:
COSMO-DE (operational data set)
- Value: precipitation rate
- Region: Germany
 - model area adjusted to observation
- Resolution:
421x461 2.8 km 15 min
 - observation data adjusted to model grid

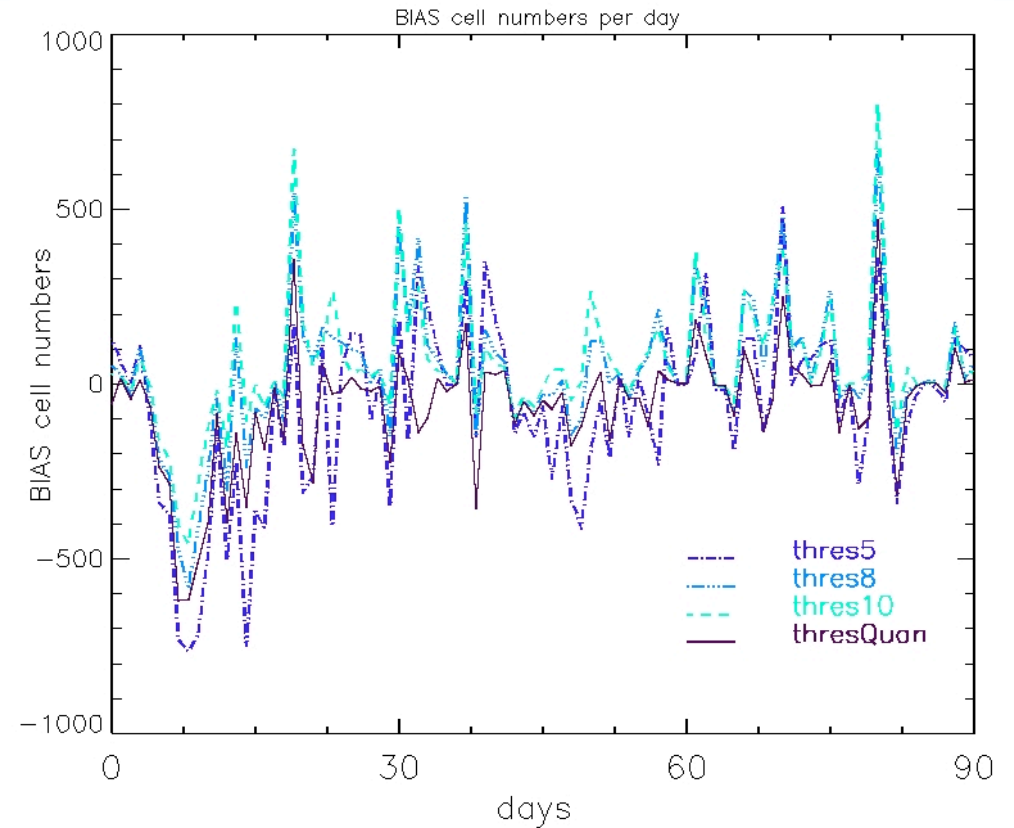


- to adjust algorithm parameters

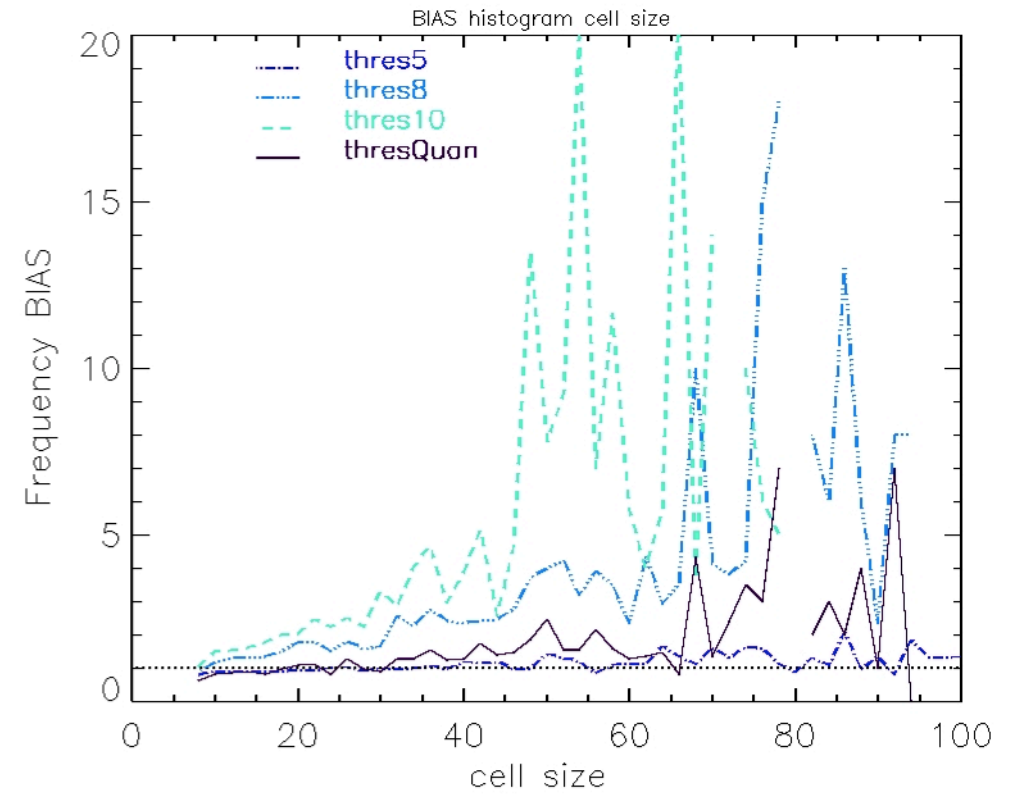
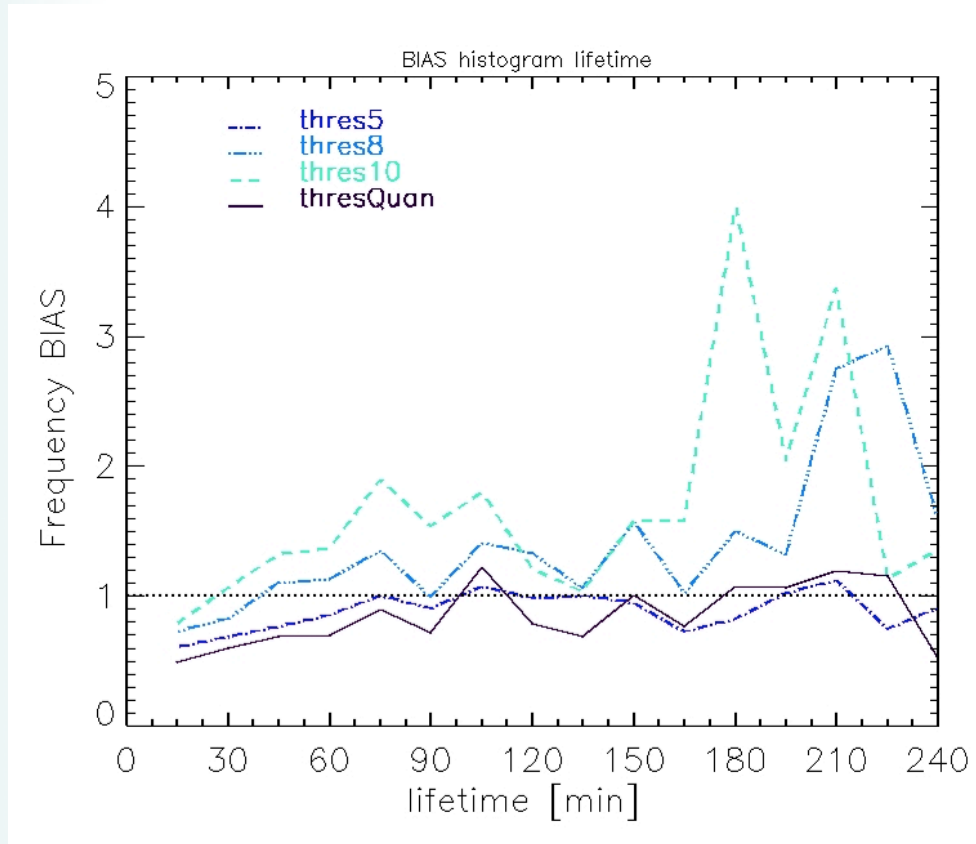




- ➡ model overestimation from ~ 5 mm/h on
- ➡ RR Obs 8 mm/h is equal to 11 mm/ RR Model



- ➡ low threshold – tendency underestimation
- ➡ high threshold – tendency overestimation



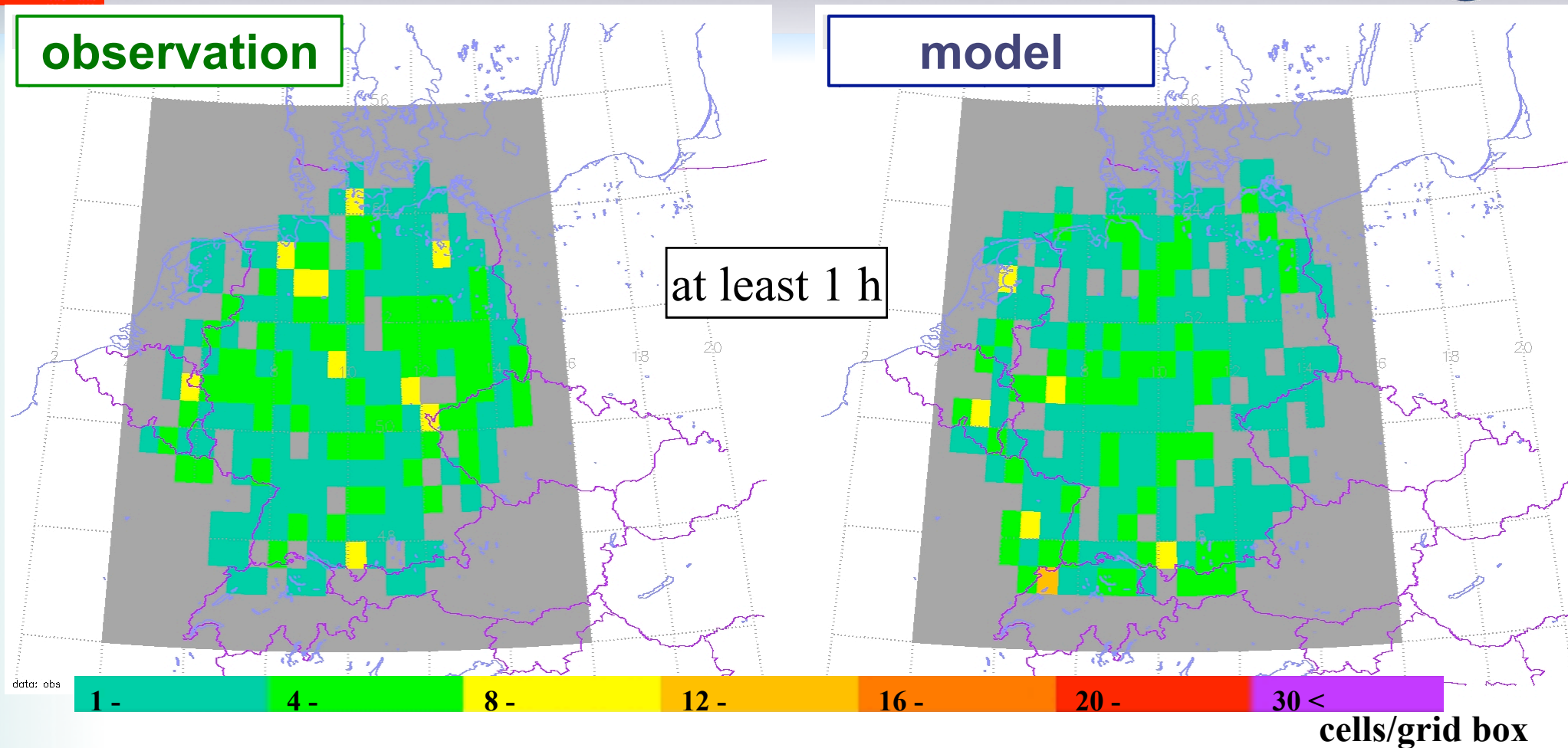
- low threshold – tendency underestimation
- high threshold – tendency overestimation
- only a few cases of long lifetime cells!

- cell size minimum 8 pixel - underestimation
- high threshold – overestimation
- only a few cases for the large cells!



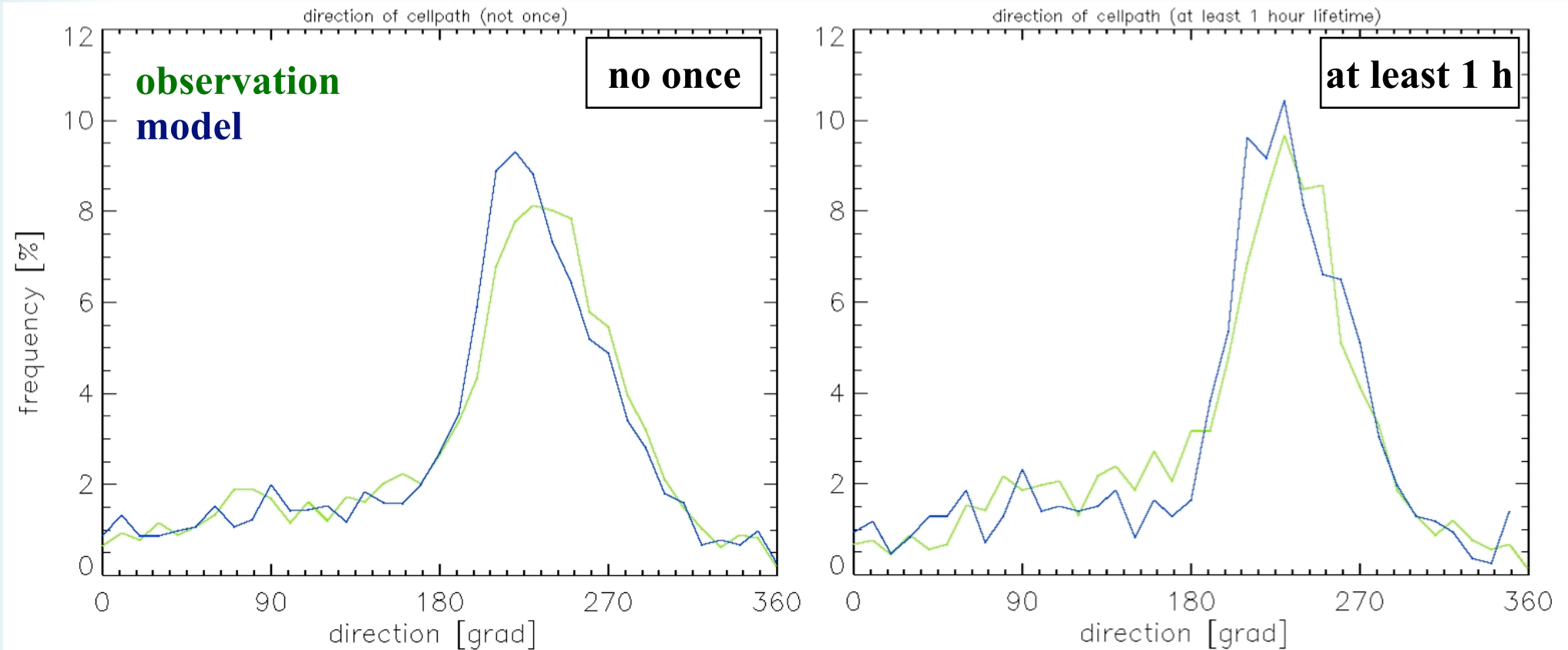
parameter settings used for following validation:

- smoth parameters:
 - medium size of kernels
- threshold:
 - observation 8 mm/h
 - model 11 mm/h

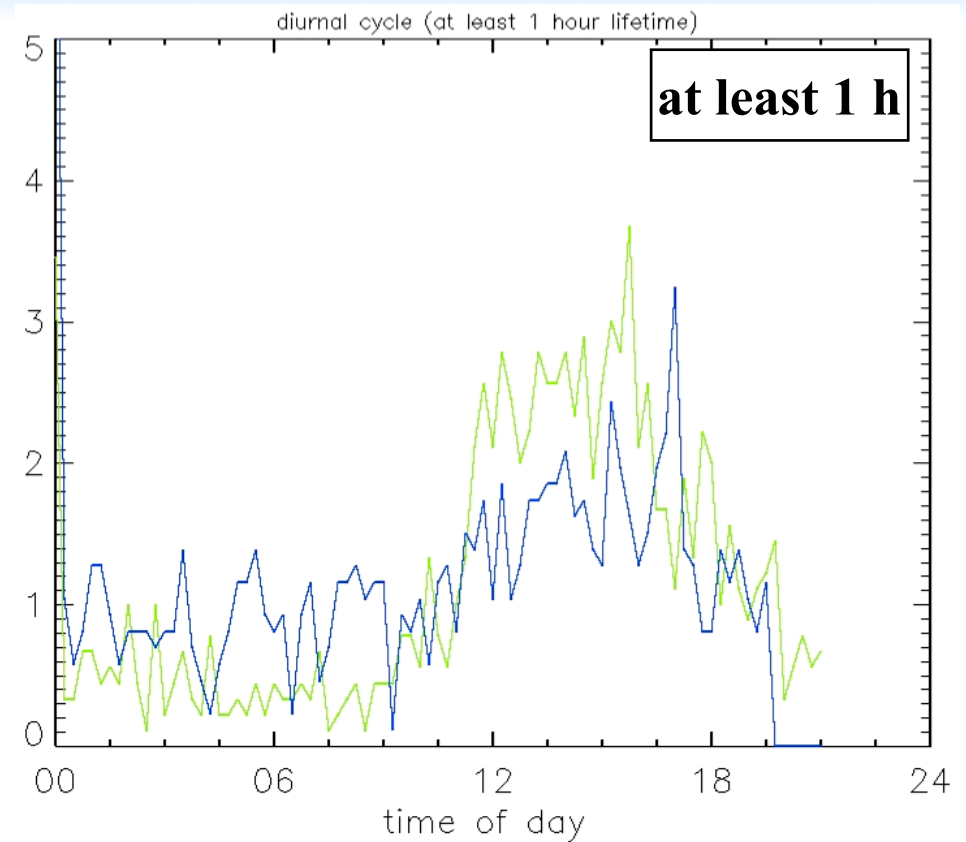
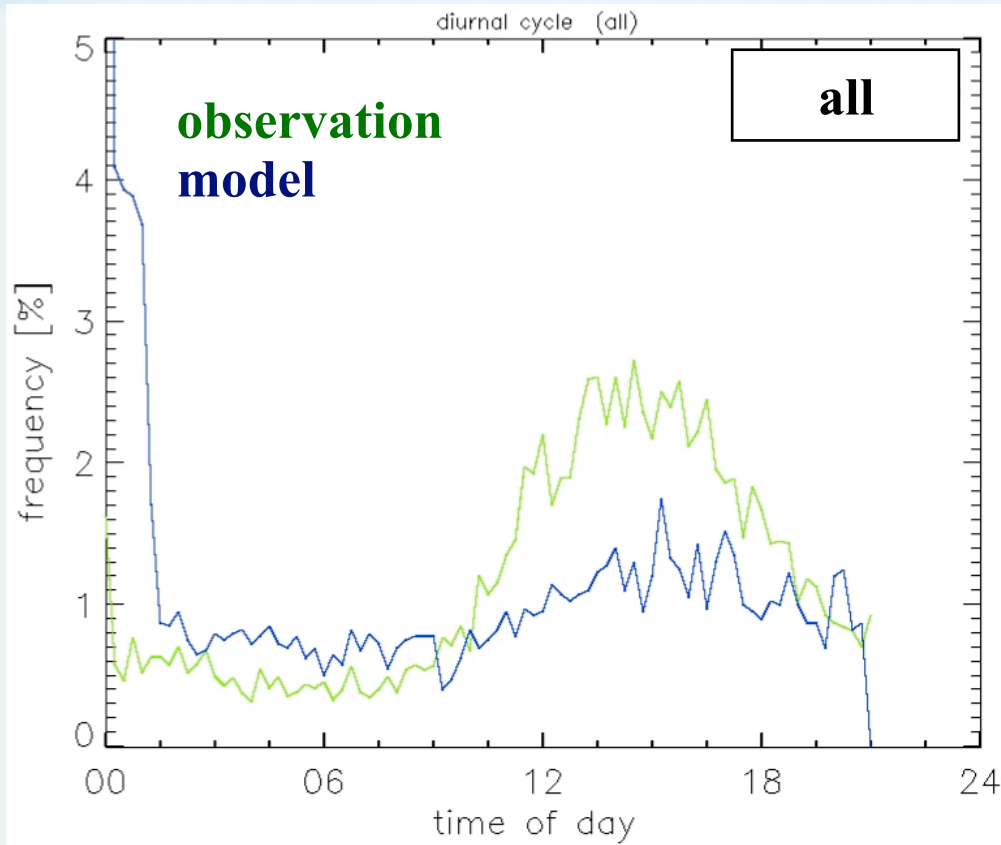


- for better interpretation use of low grid sum

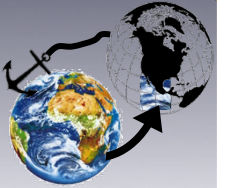
number of cells	observation	model
all	7737	3988
1h lifetime	922	863



- ➡ most cells starts in southeast
- ➡ start point from model cells slightly shifted to south



→ diurnal cycle of model cells is less pronounced



- Outlook

- analyse of other model experiments
which are already tracked but not veriflicated

Thanks for your attention!