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Use of radar observations in Harmonie: Status and plans

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Outline

1. Plans at met.no
   - Radar winds
   - Reflectivity, pseudo observations ala France
2. Challenges
3. CONRAD
4. Current status

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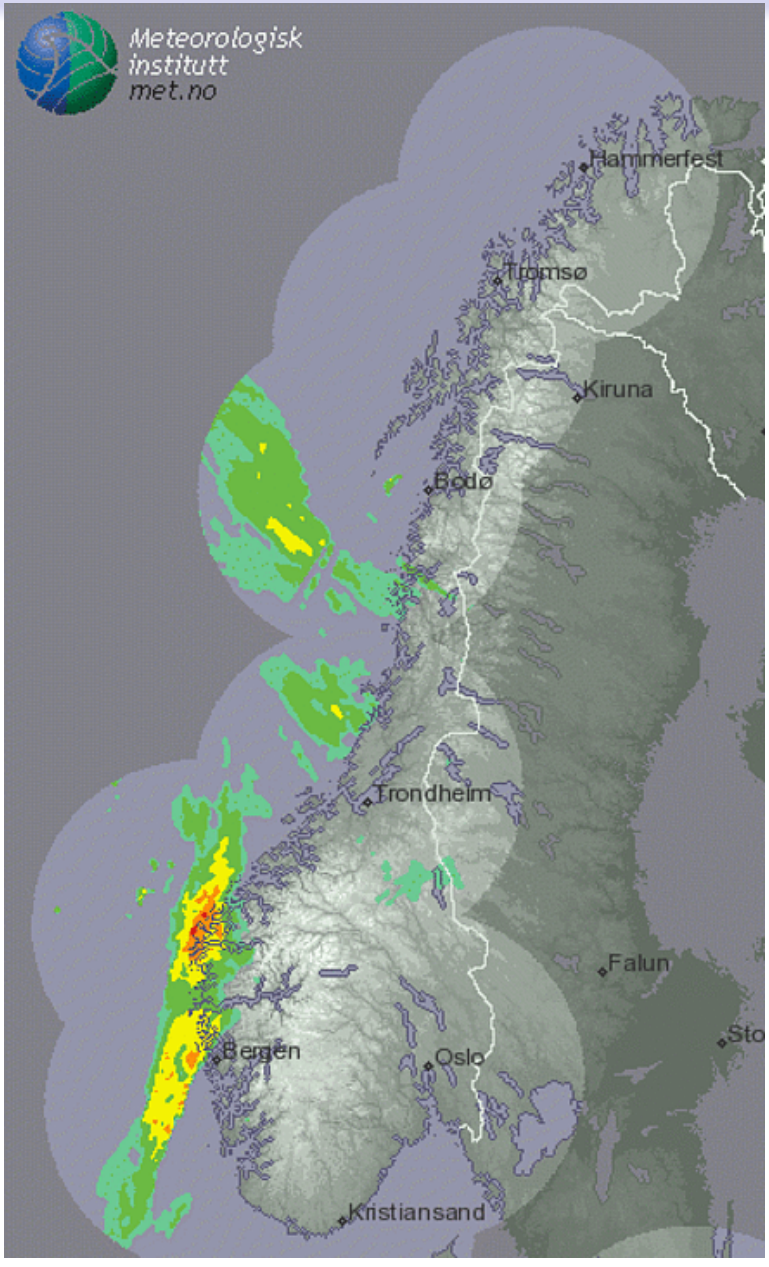
Plans at met.no

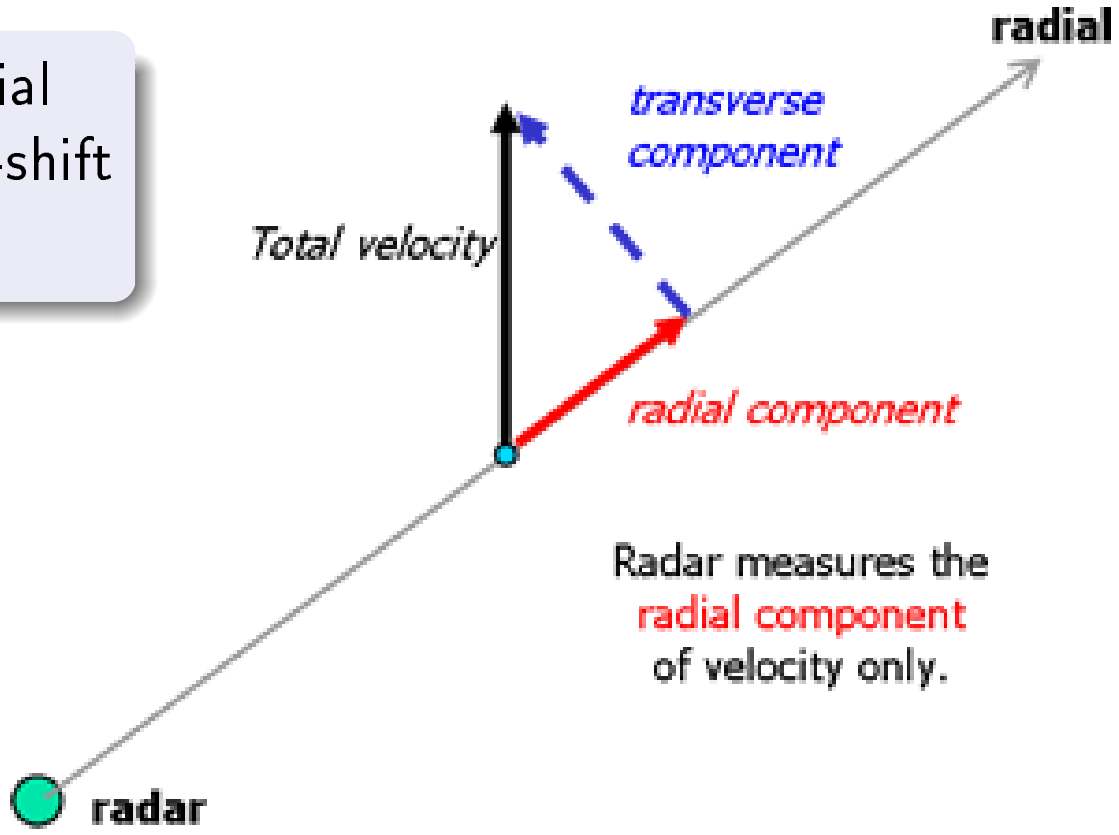
- Assimilate
  - reflectivities (precip.)
  - radial winds

  from radar observations.
- Harmonie (`NORWAY_4KM`)
- Adopt methods developed by Météo-France (AROME)



Radar wind: Principles

- Particles with radial velocity $\Rightarrow$ phase-shift
- "Doppler radars"



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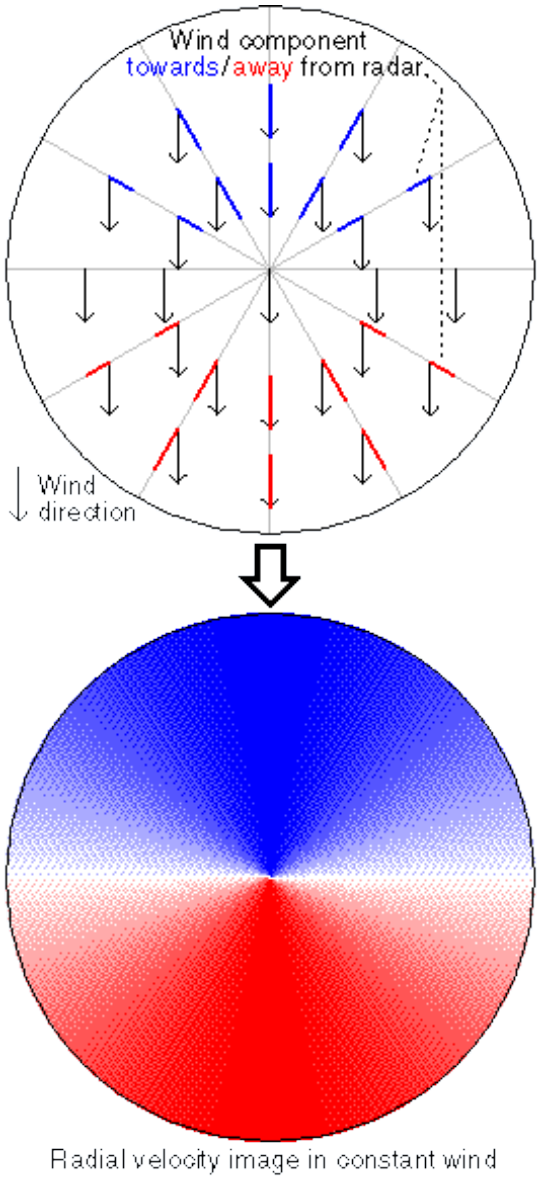

Radial velocity image in constant wind

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Radar wind: Impact study

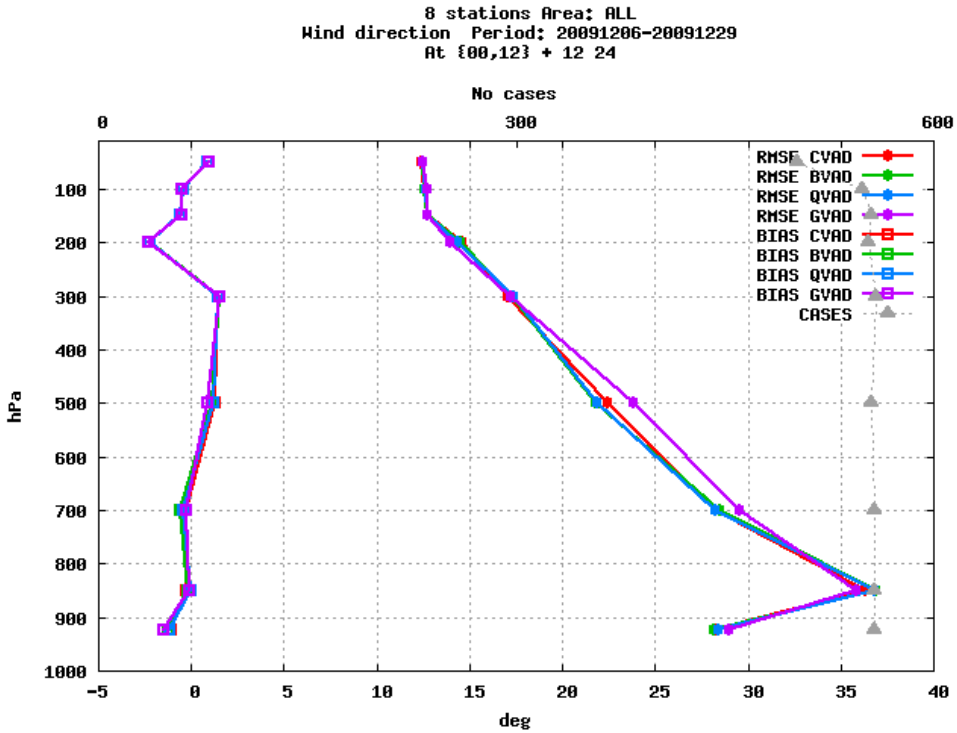
Wind profiles from radar observations

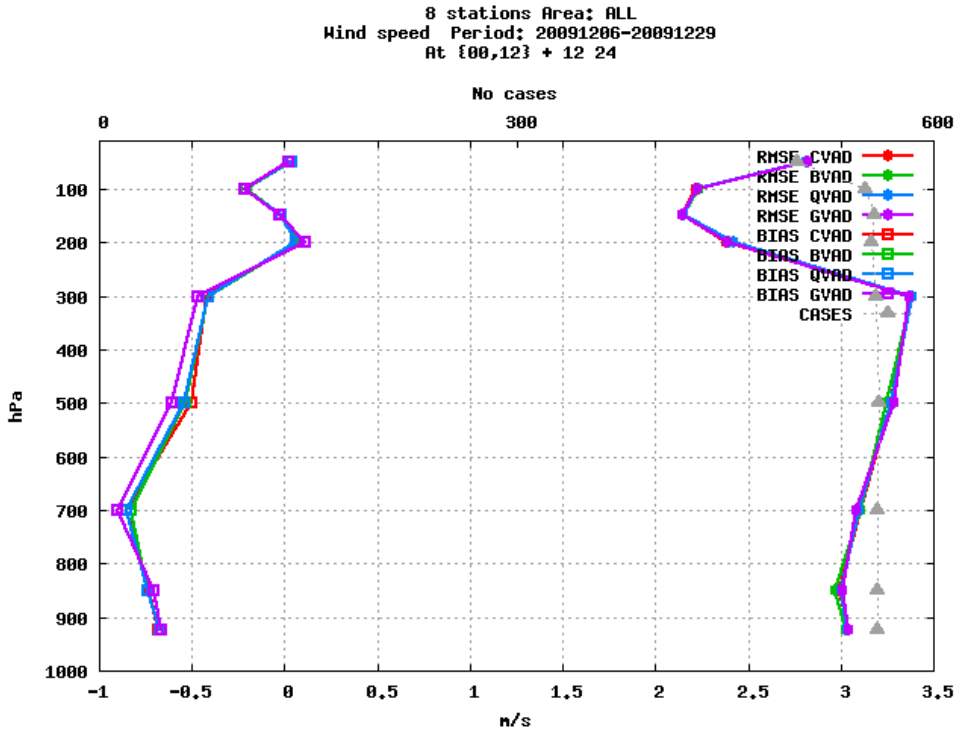
- Velocity Azimuth Display (VAD)
- Velocity Volume Processing (VVP)
- Weather Radar Wind Profiles (**WRWP**)

Frank T. Tveter and Roger Randriamampianina:
Impact study of Norwegian wind profiles in Harmonie

Impact

What is the impact of Norwegian WRWP with QC on Harmonie?





CVAD = no Norwegian WRWP, **QVAD** = QC Norwegian WRWP,

BVAD = QC+BC Norwegian WRWP, **GVAD** = All Norwegian WRWP

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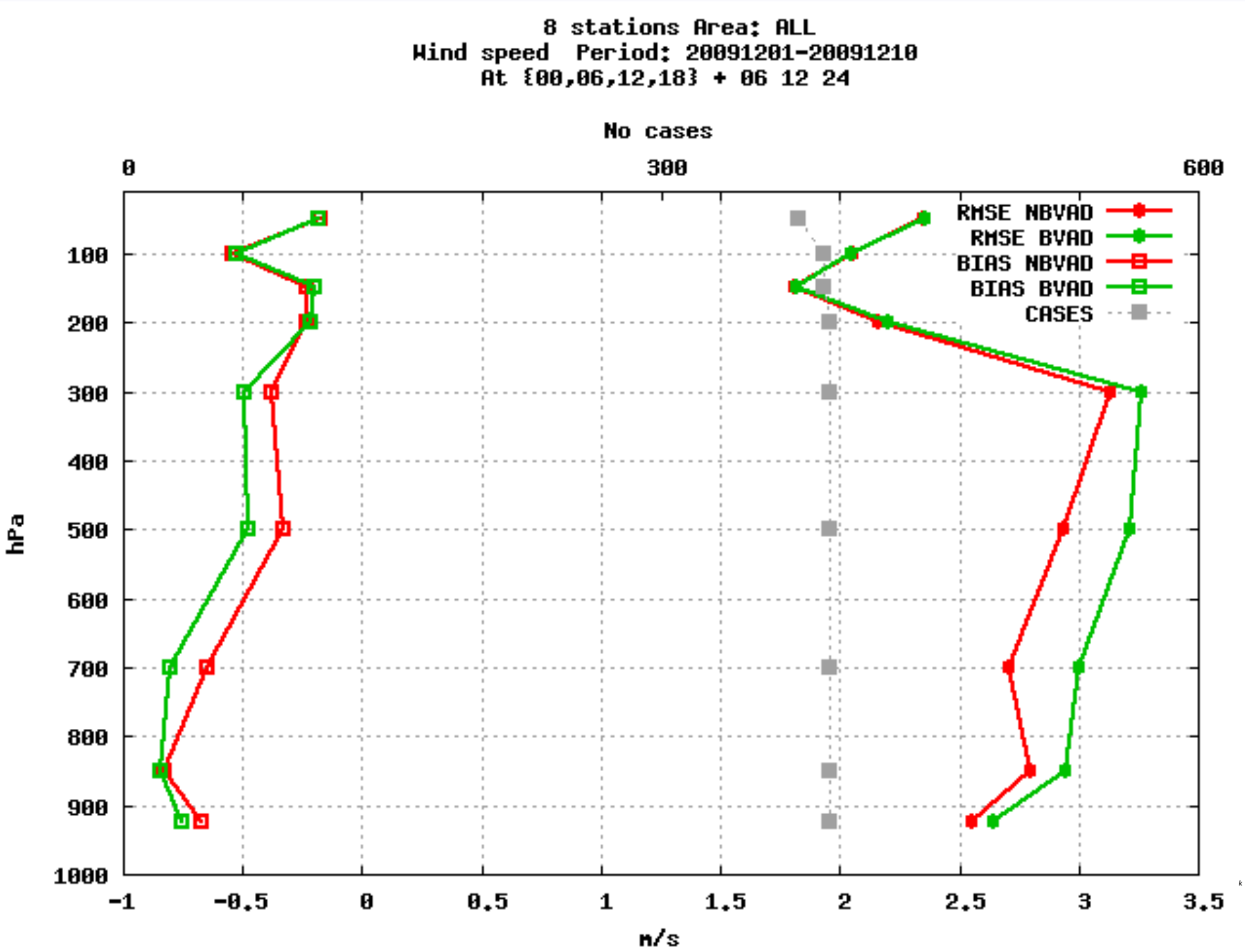
Radar wind: Impact study



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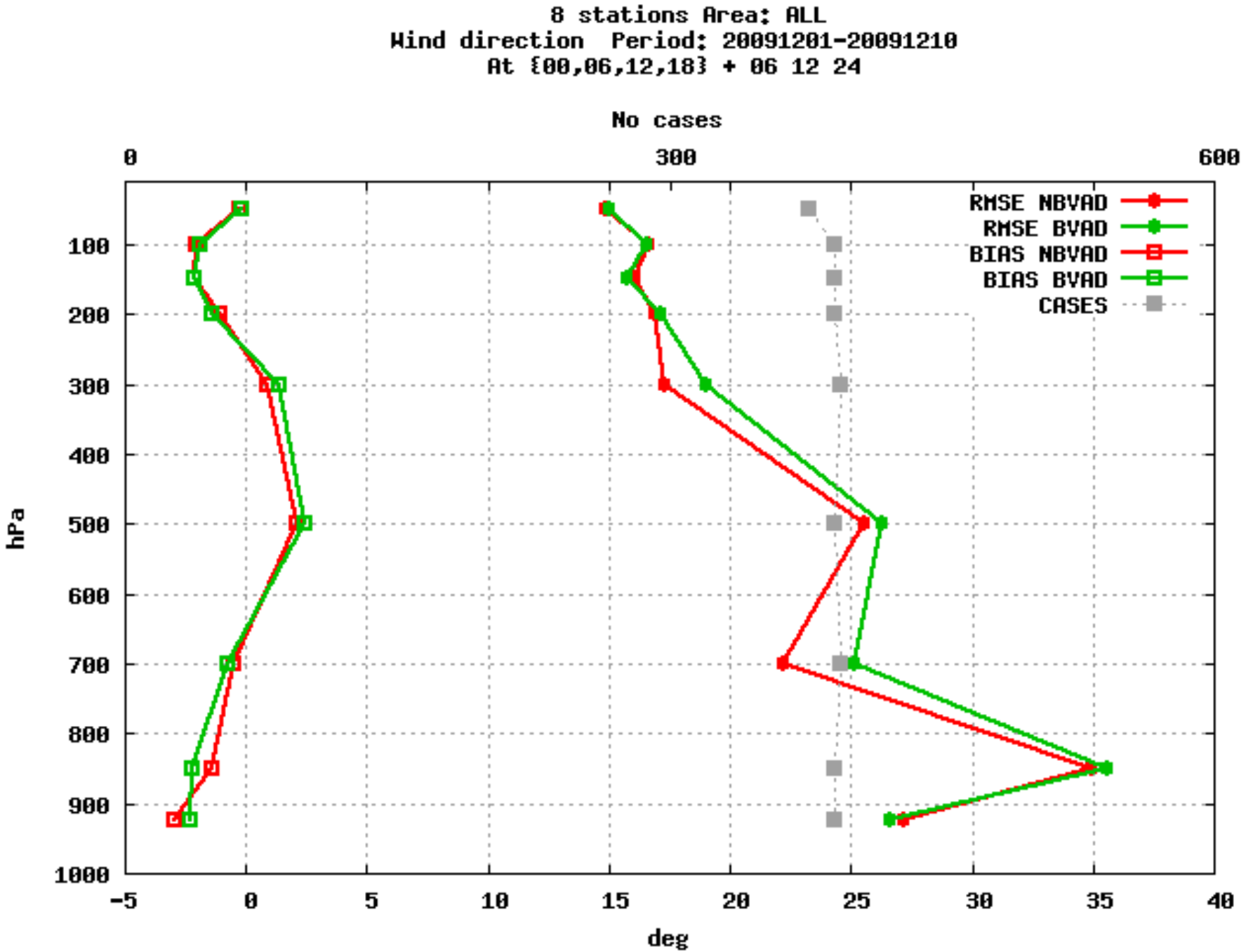

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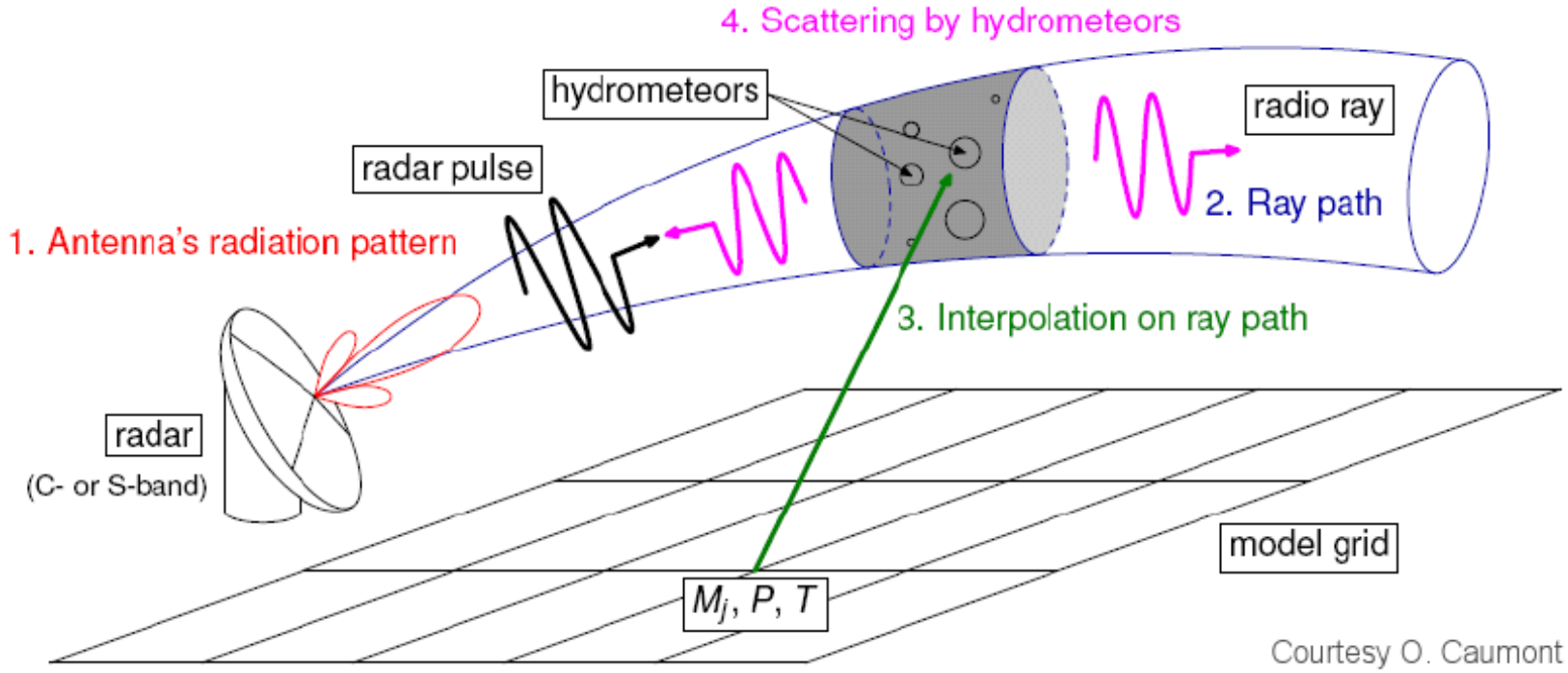
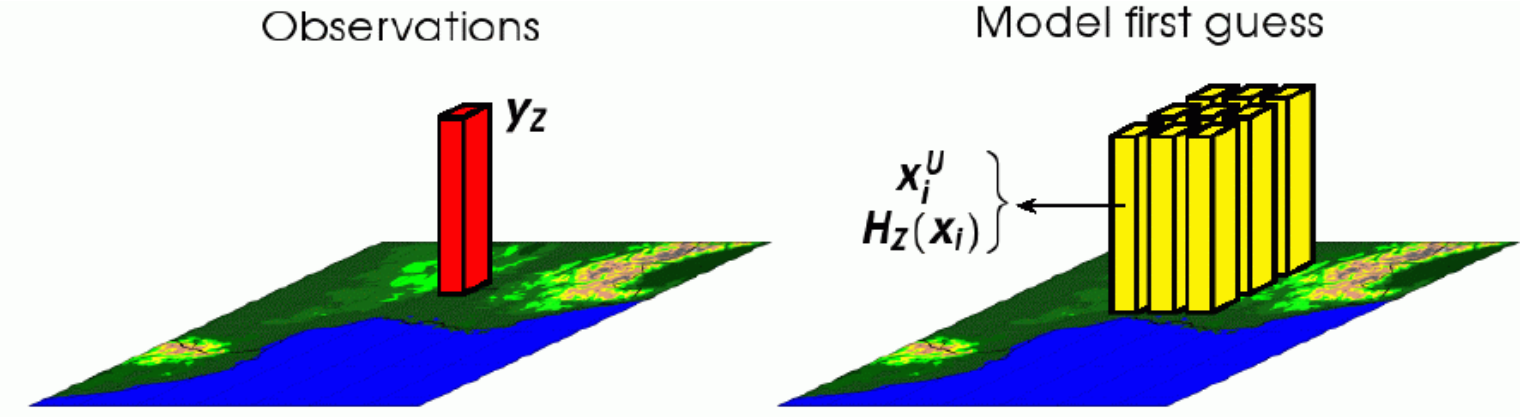
Plans at met.no: Reflectivity – Pseudo observations



$\mathbf{M}_j$ hydrometeor contents (rain water, snow, graupel, pristine ice)

Plans at met.no: Reflectivity – Pseudo observations

Adopt from Météo-France: 1D Bayesian method



(Illustration: Eric Wattrelot)

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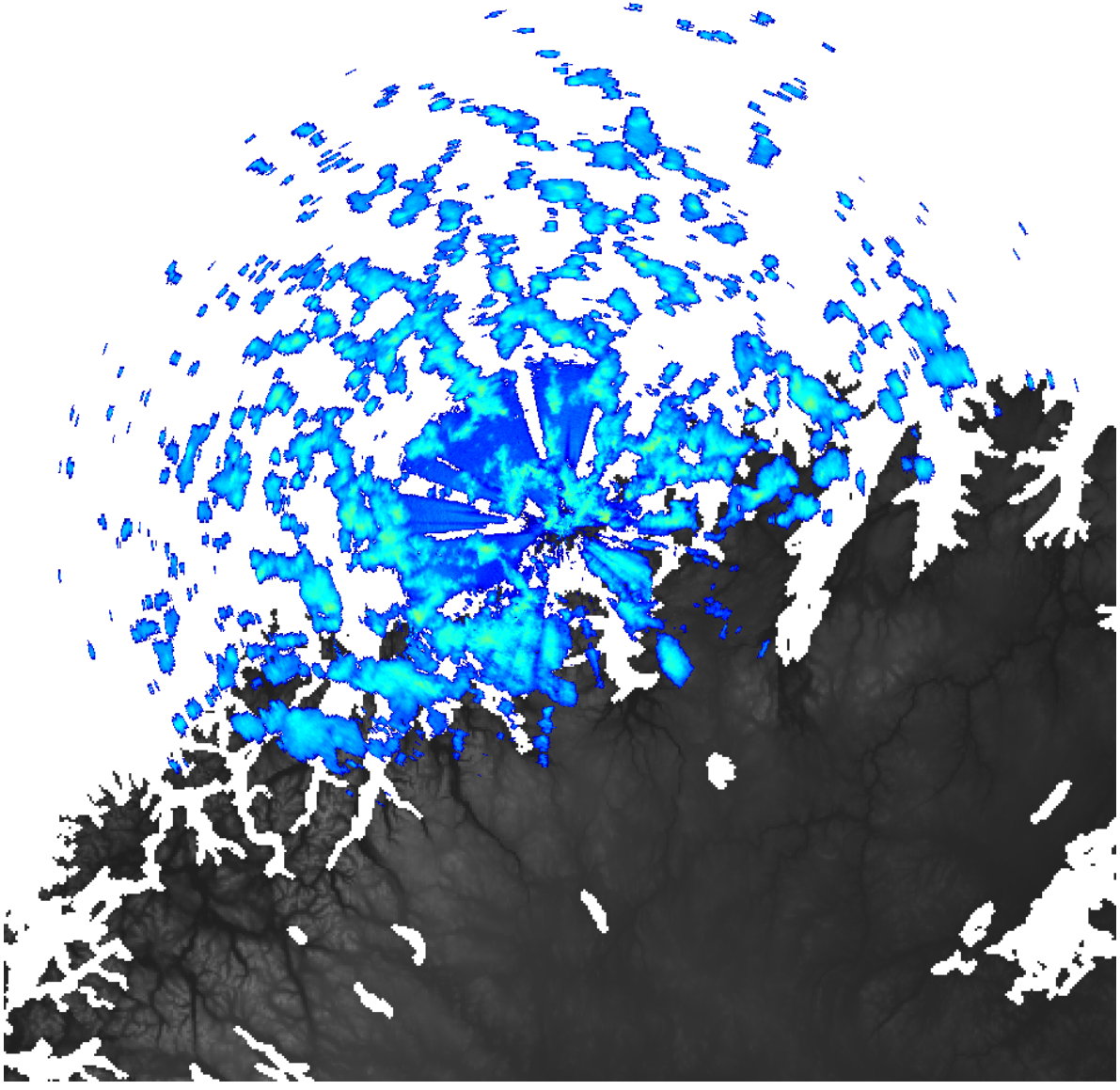
Challenges

Data quality – clutter removal



Raw

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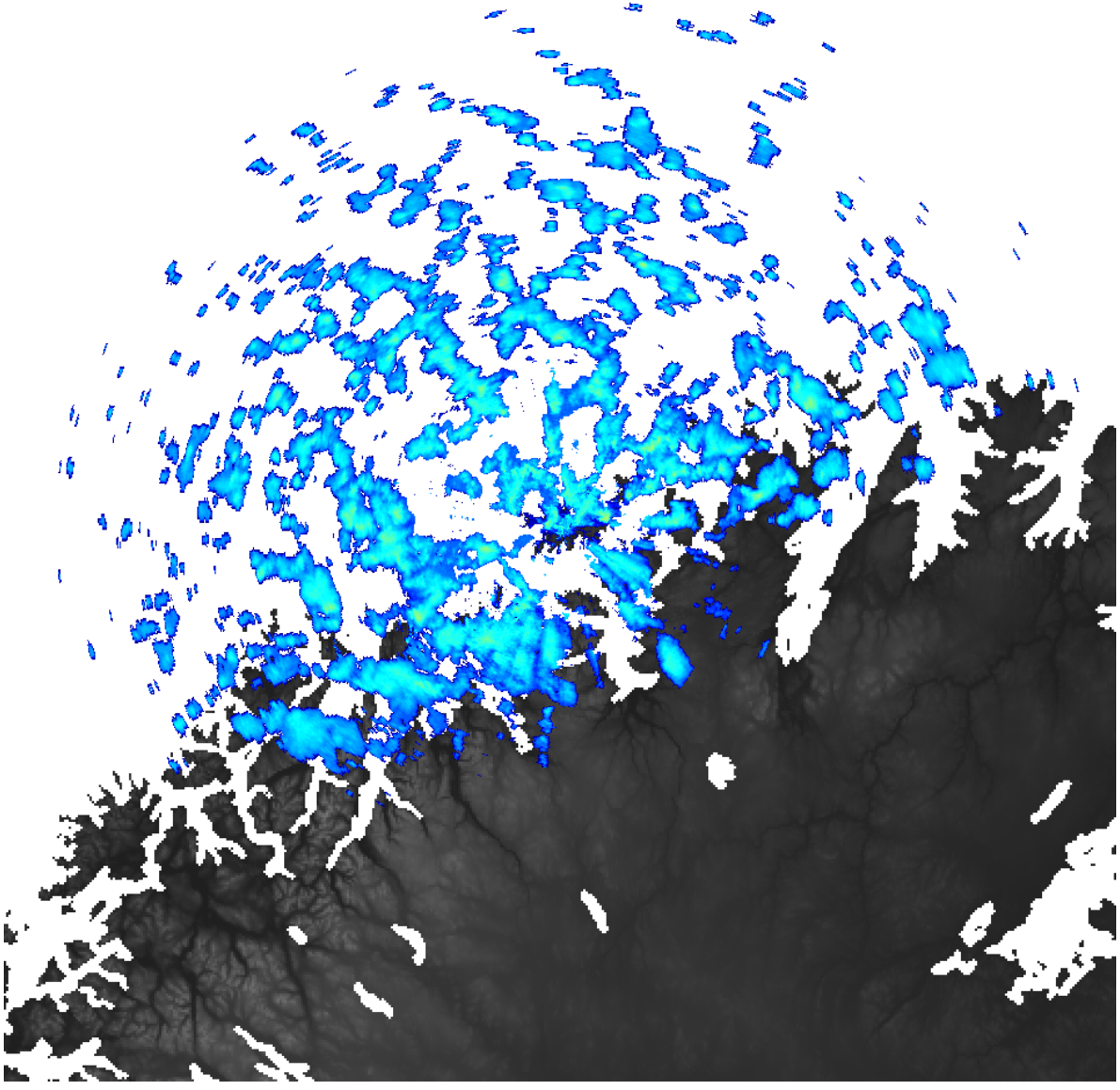
Challenges

Data quality – clutter removal



Cleaned by Fast Marching algorithm

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Challenges

How to get the radar data into Harmonie ODB?

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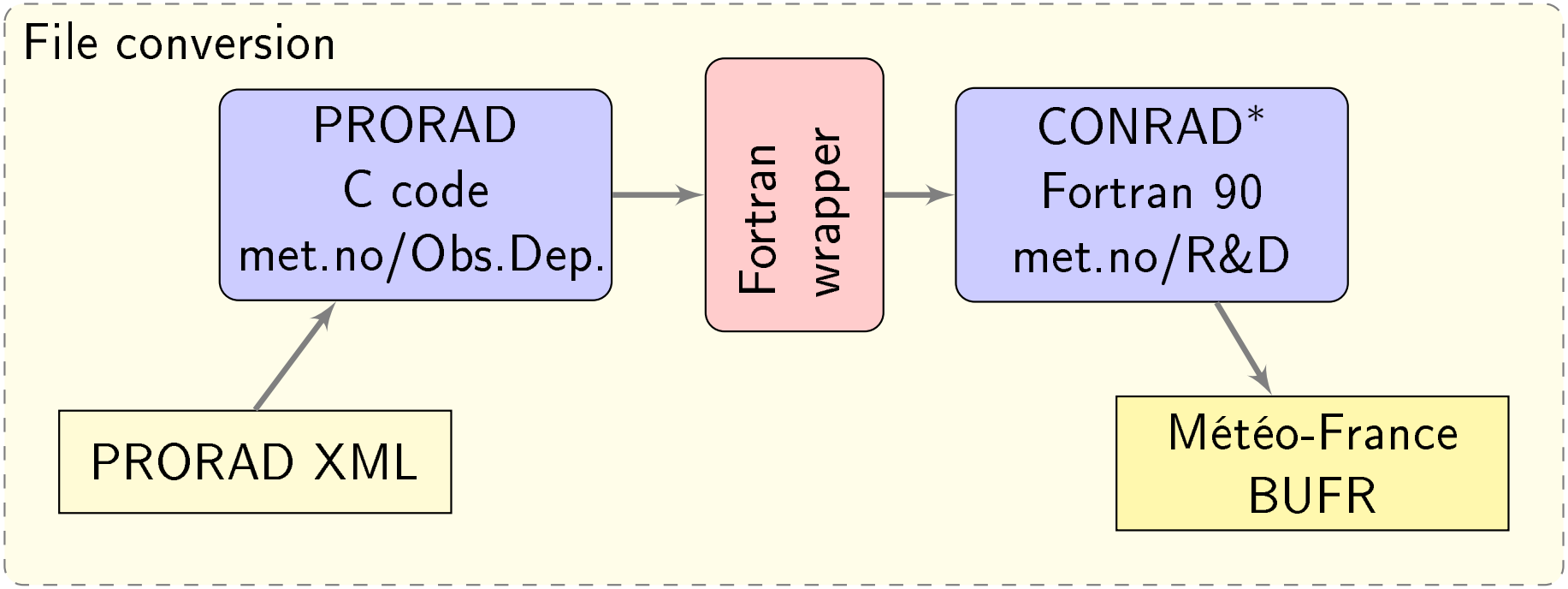
Project PRERAD – PREparation of RADar data

CONRAD: CONversion of RADar data

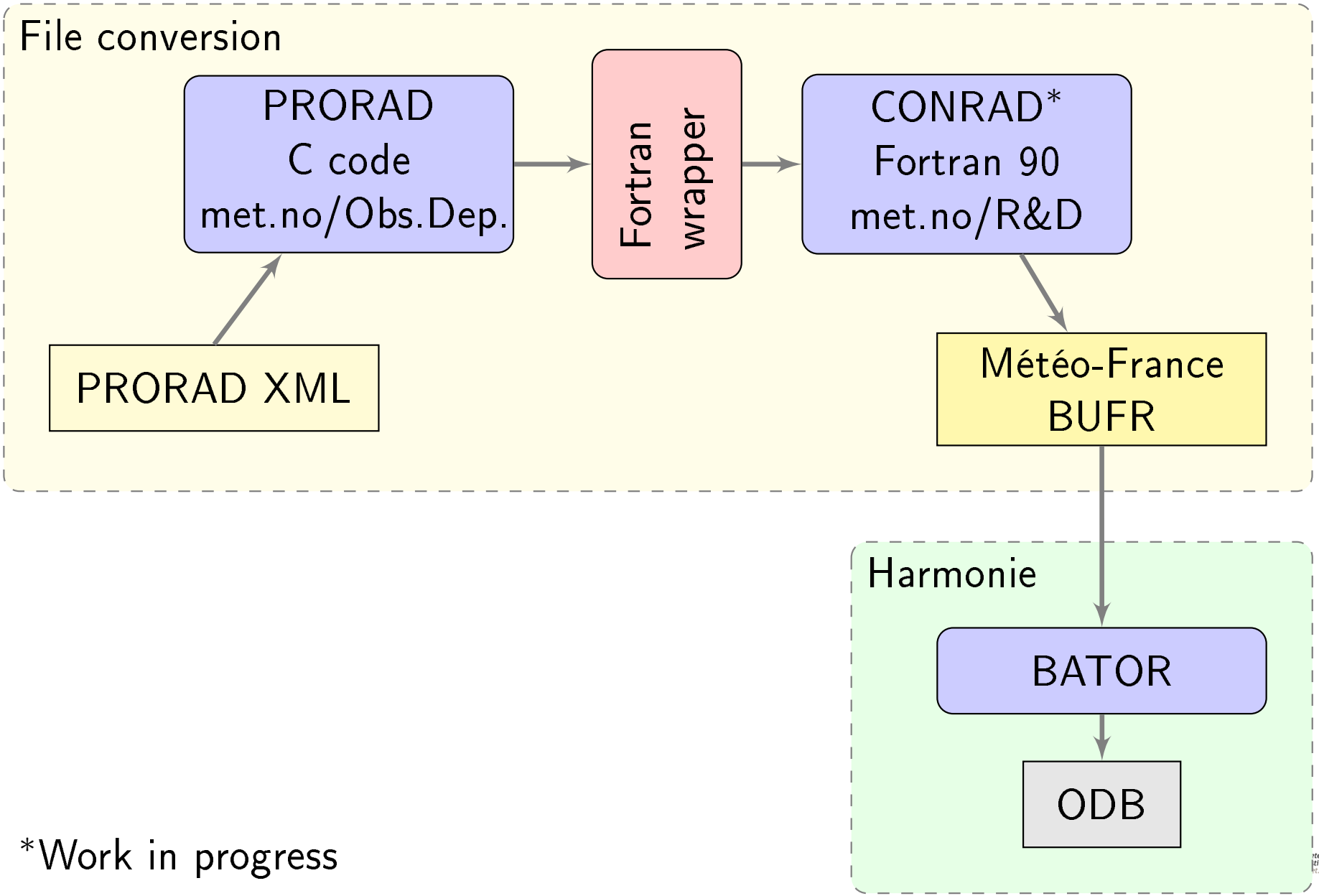
Convert local radar data into Météo-France BUFR format

CONRAD: CONversion of RADar data



*Work in progress

CONRAD: CONversion of RADar data



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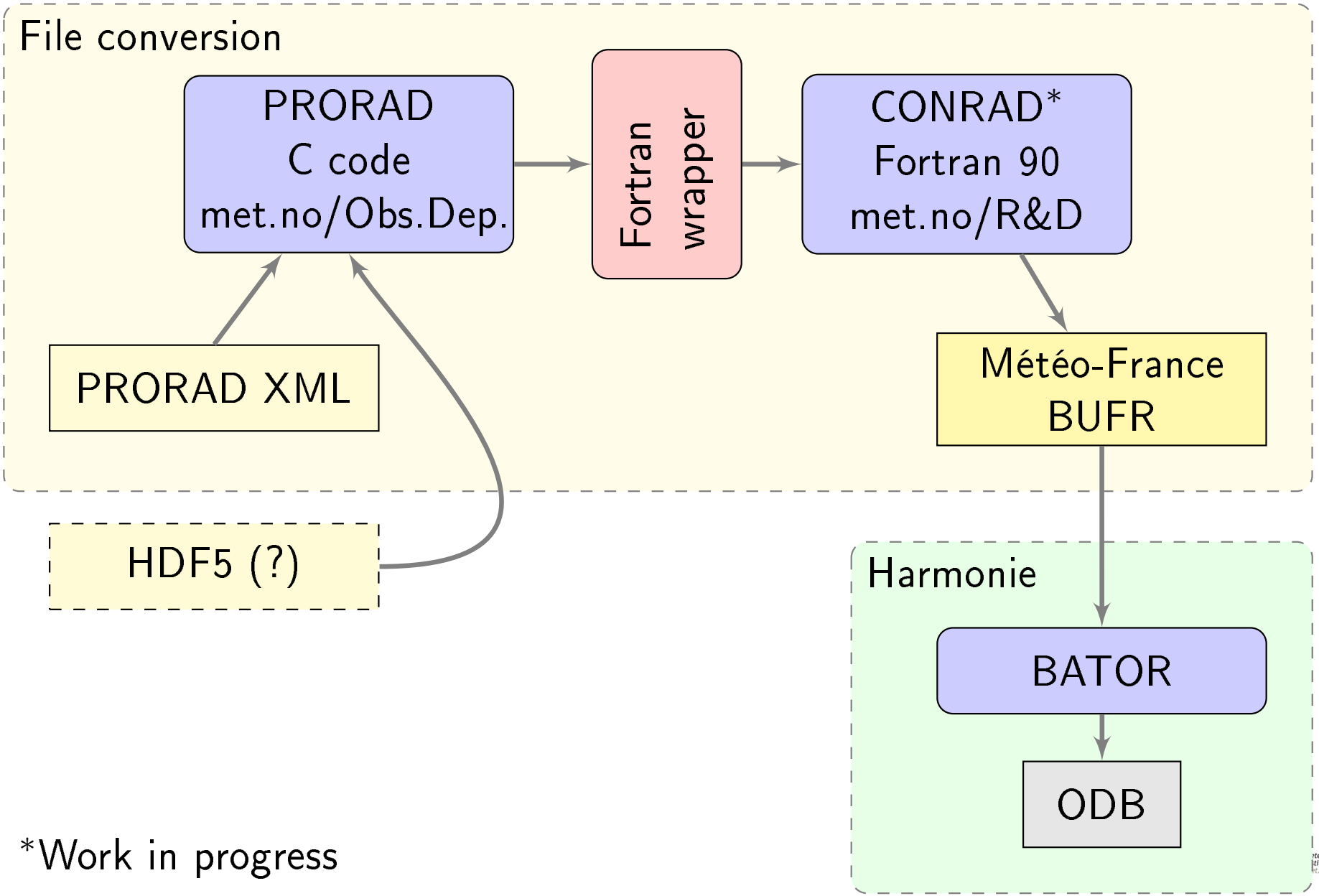

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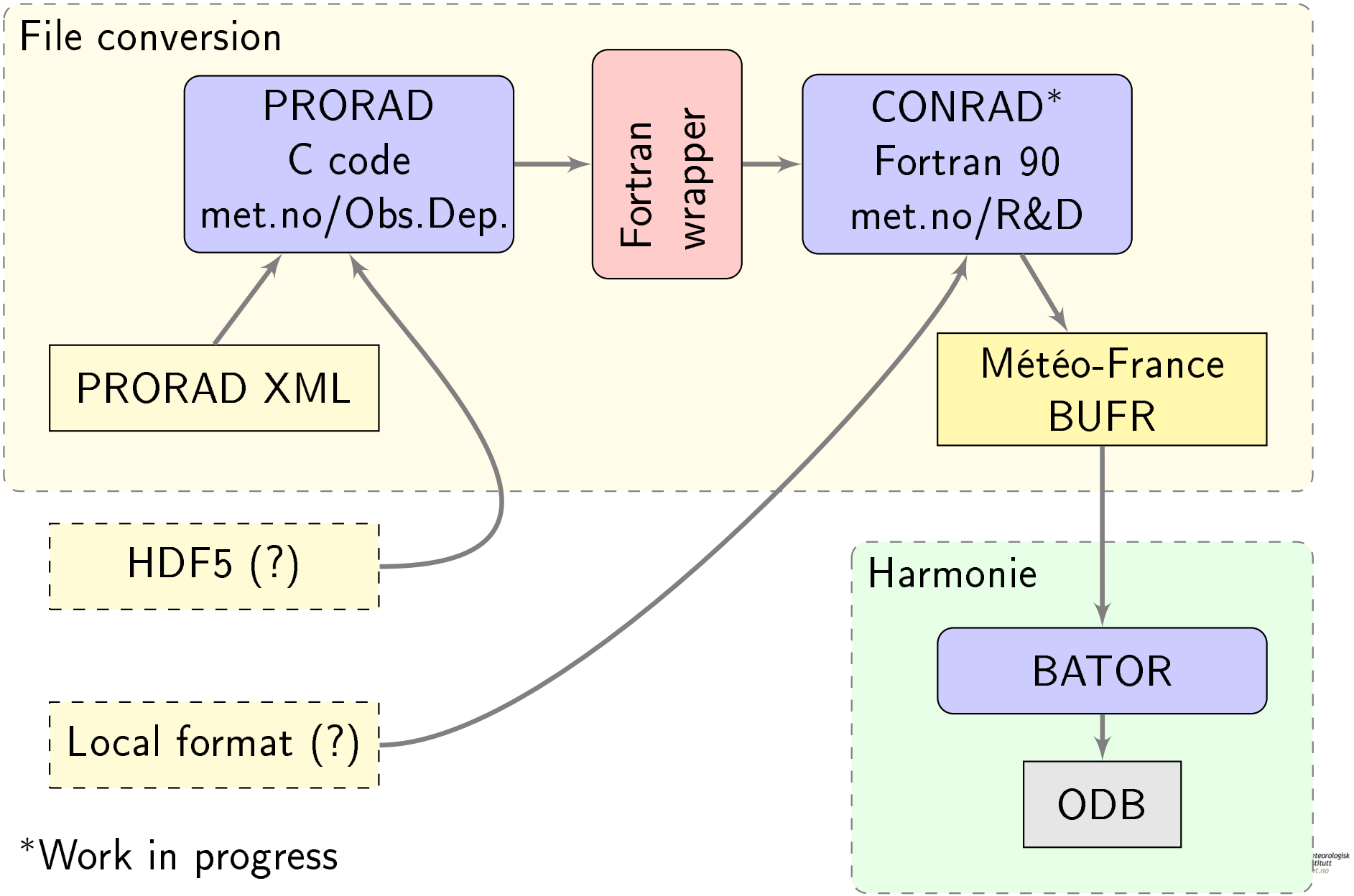

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Status

- Local radar reflectivity data is successfully converted
- Radial winds is not yet implemented
- Quality flagging is not yet implemented

Raw reflectivity data accepted by BATOR $\Rightarrow$ ODB
Can compare simulated and observed reflectivity

First attempt on visualizing radar obs. from ODB...

Using Metview

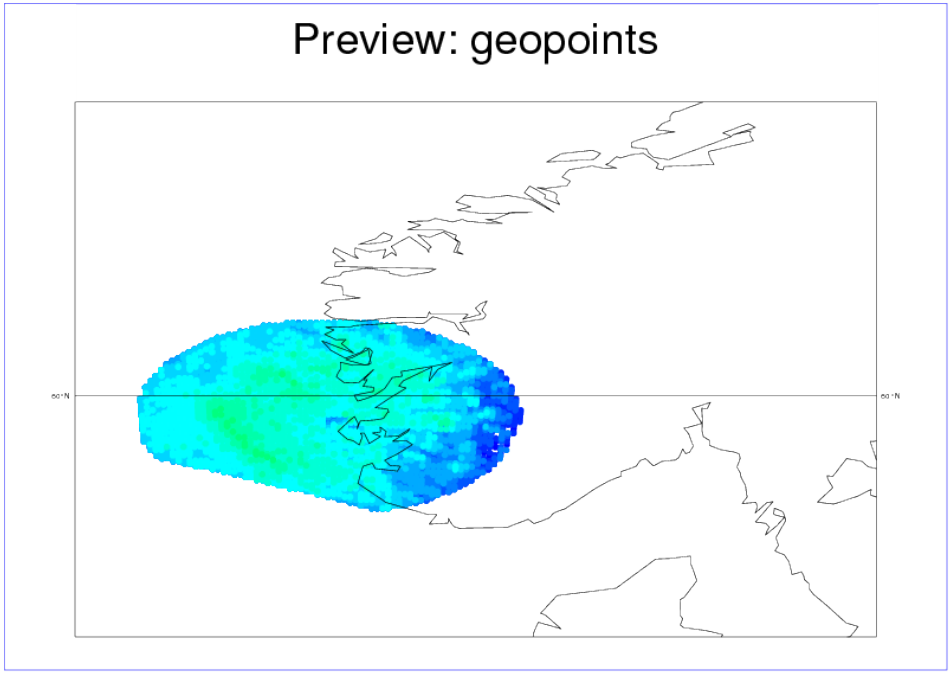

Figure: Observed reflectivity

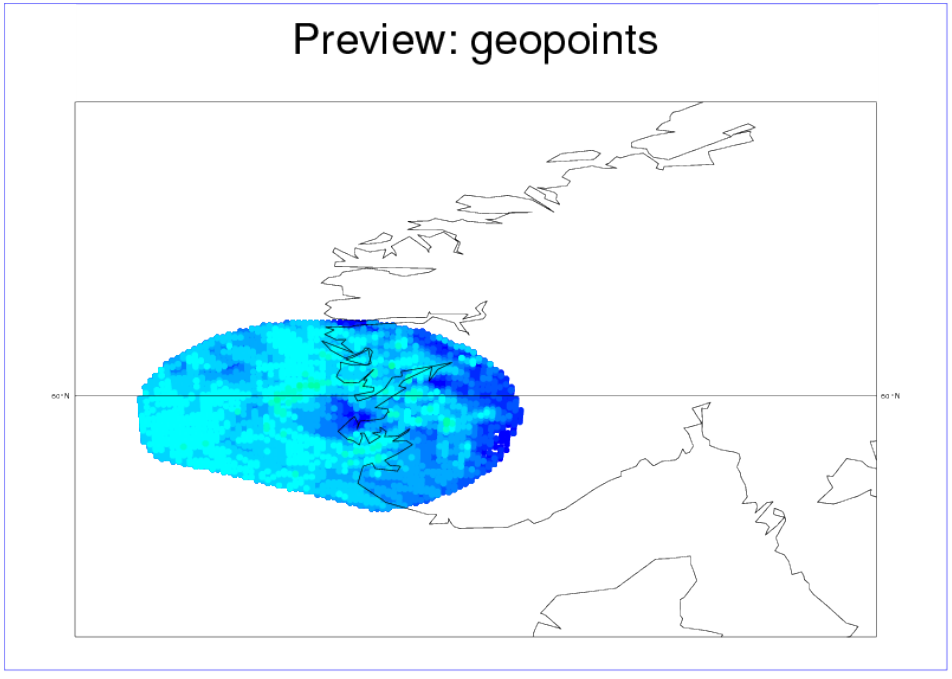

Figure: Simulated reflectivity

Thank you!

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Don't forget Roger Randriamampianina's nice poster:

The sensitivity of the HARMONIE/Norway forecasts to differents observation types