

# THE MTG-IRS LEVEL 2 PROCESSOR: NWC APPLICATIONS

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# Co-Author list

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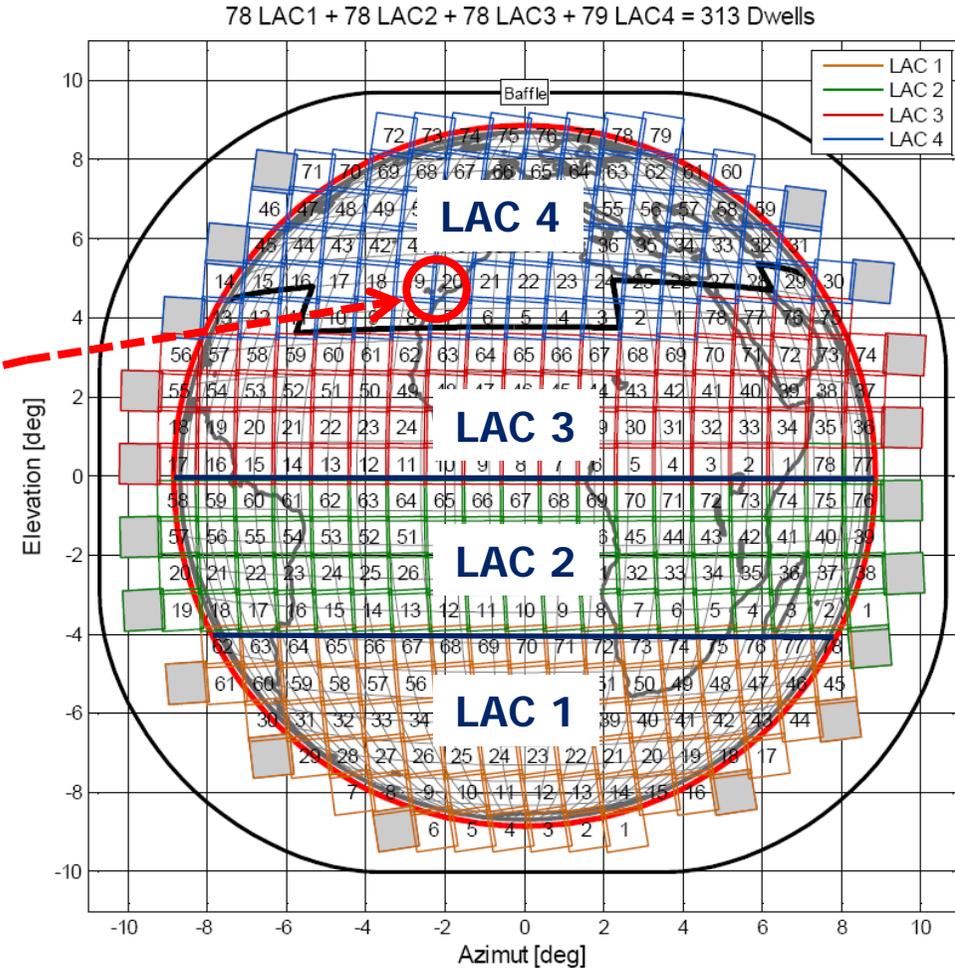
# Meteosat Third Generation InfraRed Sounder (MTG-IRS)

- Part of EUMETSAT geostationary satellite programme.
  - Mounted on MTG-S platform
  - Planned launch 2021
- Mission objective:
  - High spatial and temporal resolution observations of  $q(p)$  and  $T(p)$

- Imaging FTS:
  - moderate spectral resolution ( $0.625 \text{ cm}^{-1}$ ) in two bands ( $700\text{-}1210 \text{ cm}^{-1}$  and  $1600\text{-}2175 \text{ cm}^{-1}$ )
- Spatial sampling 4 km at SSP
- Temporal sampling: 10 sec
- 2 detector arrays: 160 x 160 detectors

# Recall Spatial Coverage

- The Earth disc is split in 4 Local Area Coverage (LAC) Zones
- Numbered from South to North
- Hence LAC1 is South Africa and LAC4 is Europe (strange shape needed to cover Canary Islands)
- 1 LAC covered in 15min (so the entire Earth can be theoretically covered every hour)
- But LAC4 is revisited every 30min



# MTG-IRS Level 2 Demonstration and Validation Processor

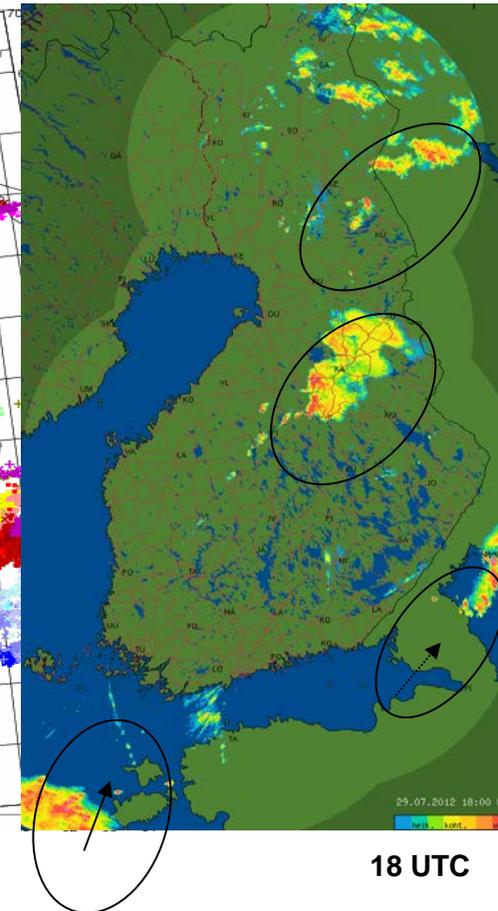
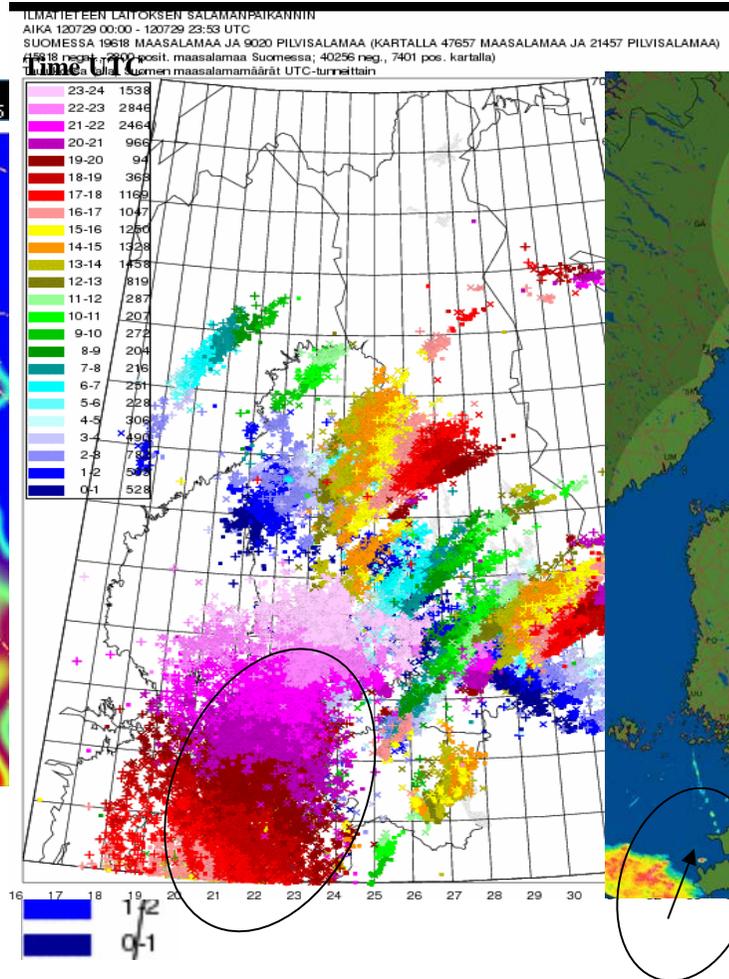
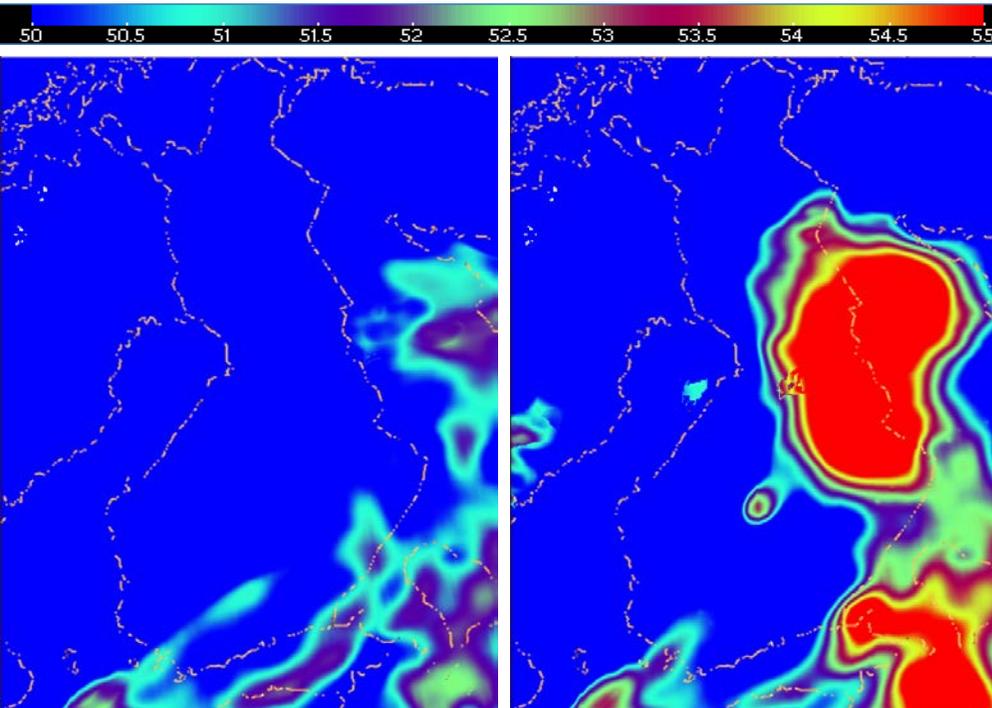
- Supports the detailed definition of the operational processor,
- End-to-end Processor
  - Pre Processing: Scene classification
  - Product generation: 1DVAR
    - Based on UWPHYSRET/Mirto used for CrIS/IASI at Univ. of Hawaii with direct readout
  - Post Processing: Scaled Projected State
- Selected results from application to IASI data.

# Demonstrations for NWC applications

- Analysis:
  - LAPS
  - W3Dx
- Assimilation in regional scale NWP

# Analysis of TT index with and without L2 products by LAPS

- Results 29 July 2012, 18UTC**



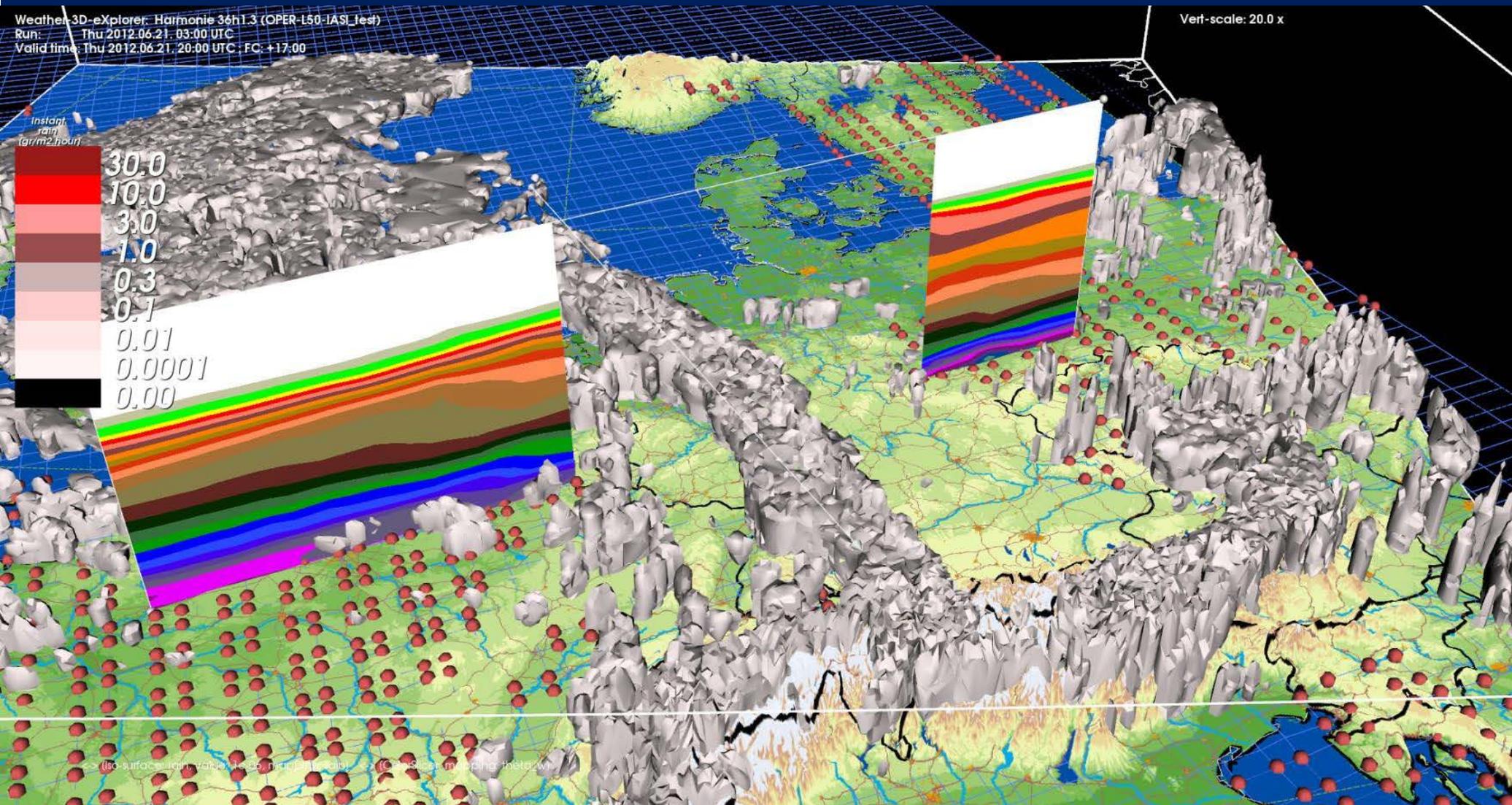
## TT-index values:

- > 50 moderate-severe thunderstorms
- > 60 severe thunderstorms

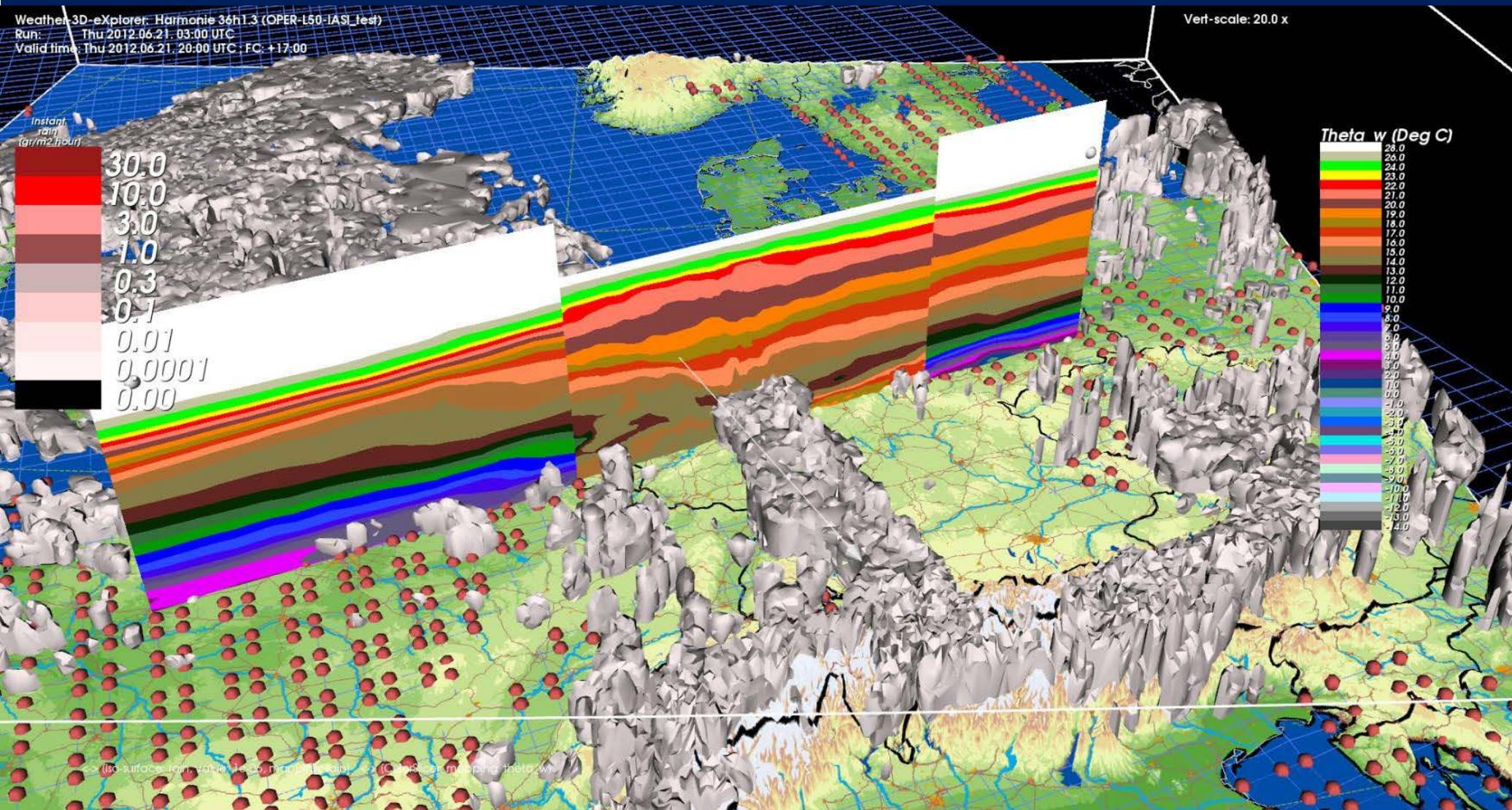
# Weather 3D Explorer application [KNMI]

- Work by M. Koutek (KNMI) to integrate level 2 products into a 3D visualisation tool
- Poorly represented here as static 2d images.

# Theta W from retrievals in W3Dx



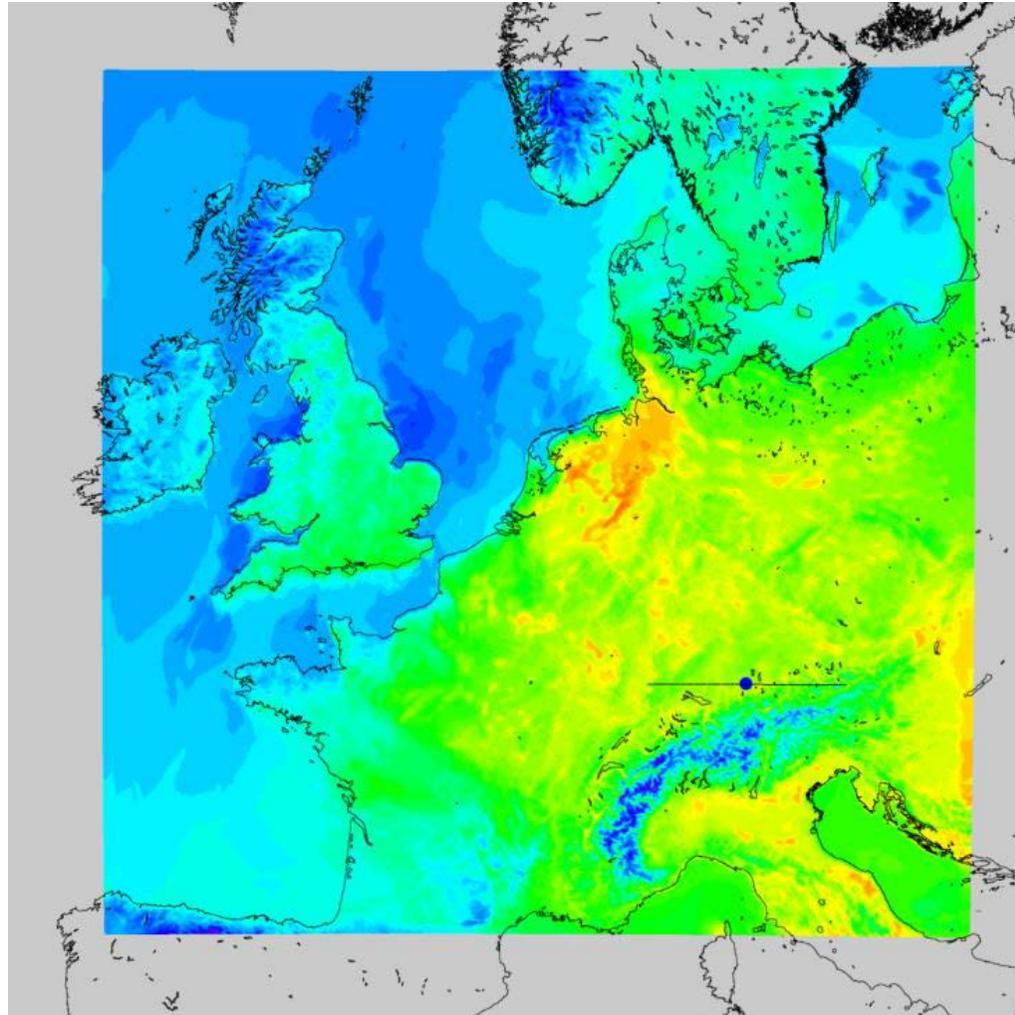
# Theta W from retrievals and HARMONIE in W3Dx



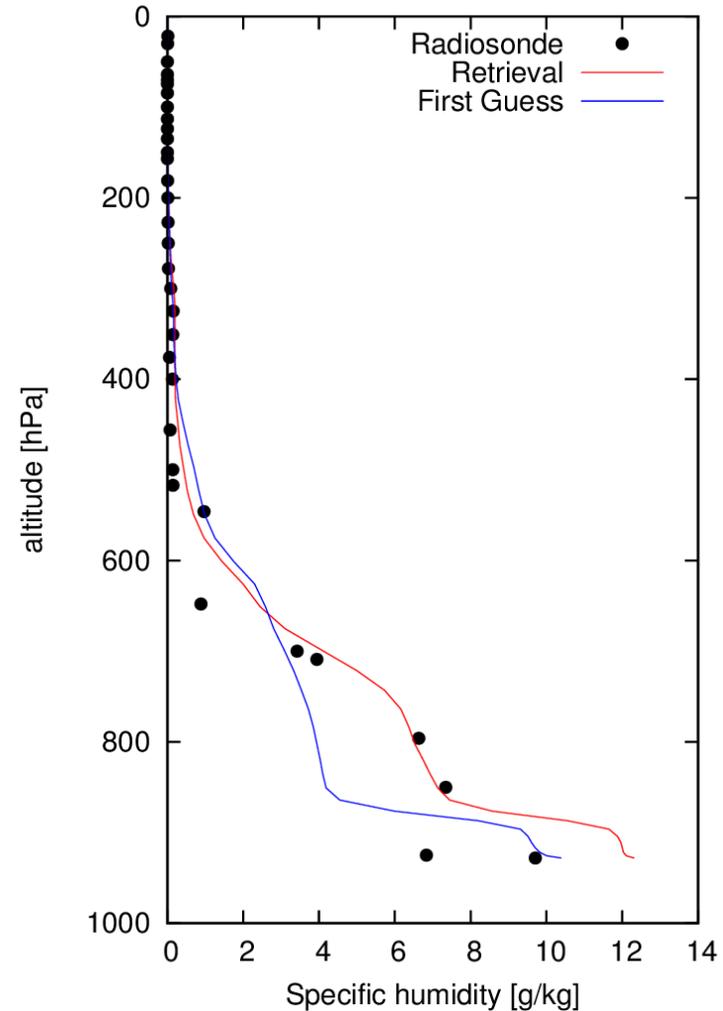
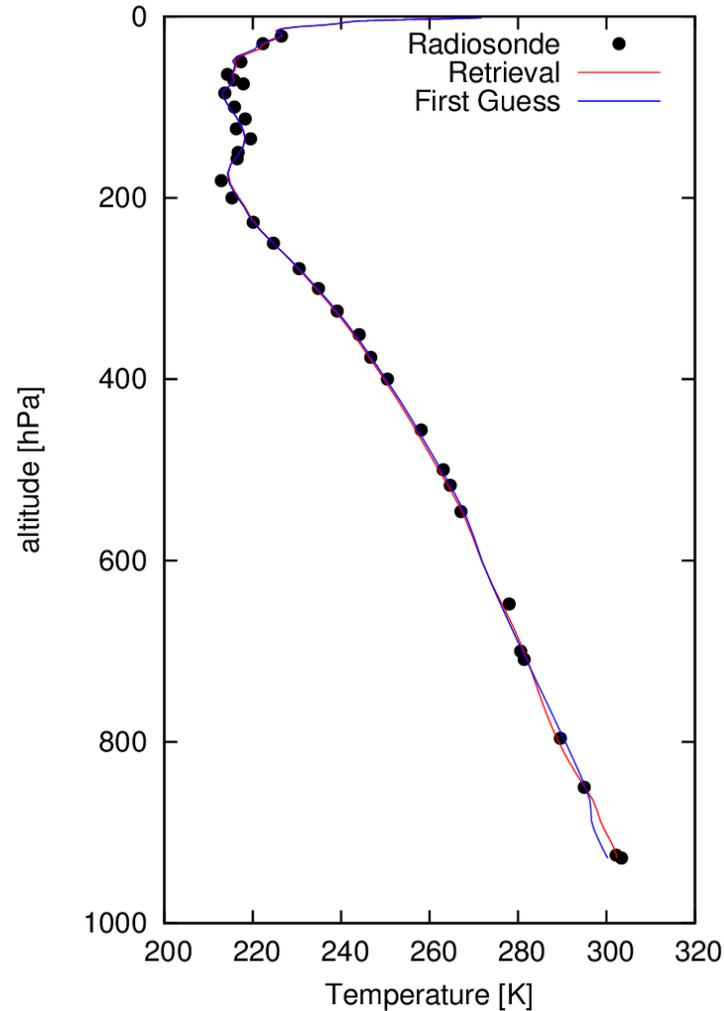
# Direct assimilation of L2 products

- Currently investigation of relative merits of level 2 assimilation after transformation of level 2 to mitigate background information (Following Migliorini, 2012)
- Currently focus on single profile to test the technical infra-structure, next will be assimilation of all IASI products for 3 week period

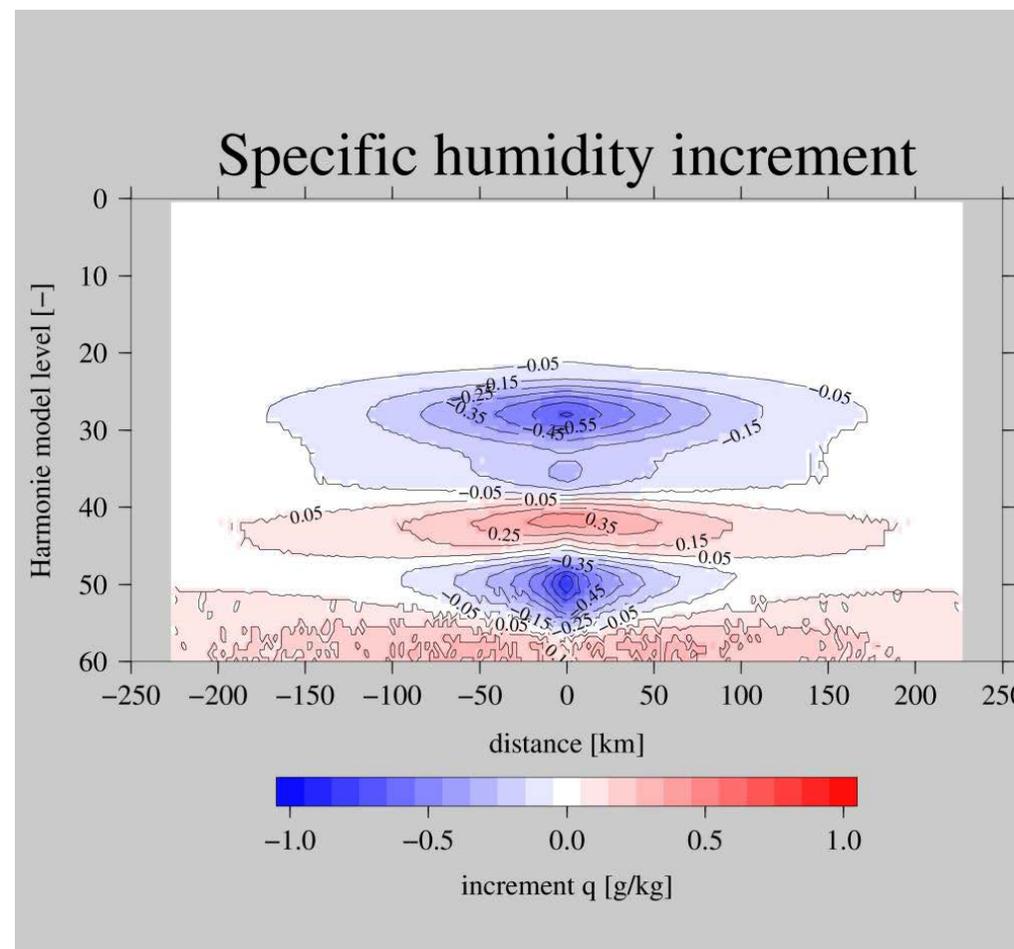
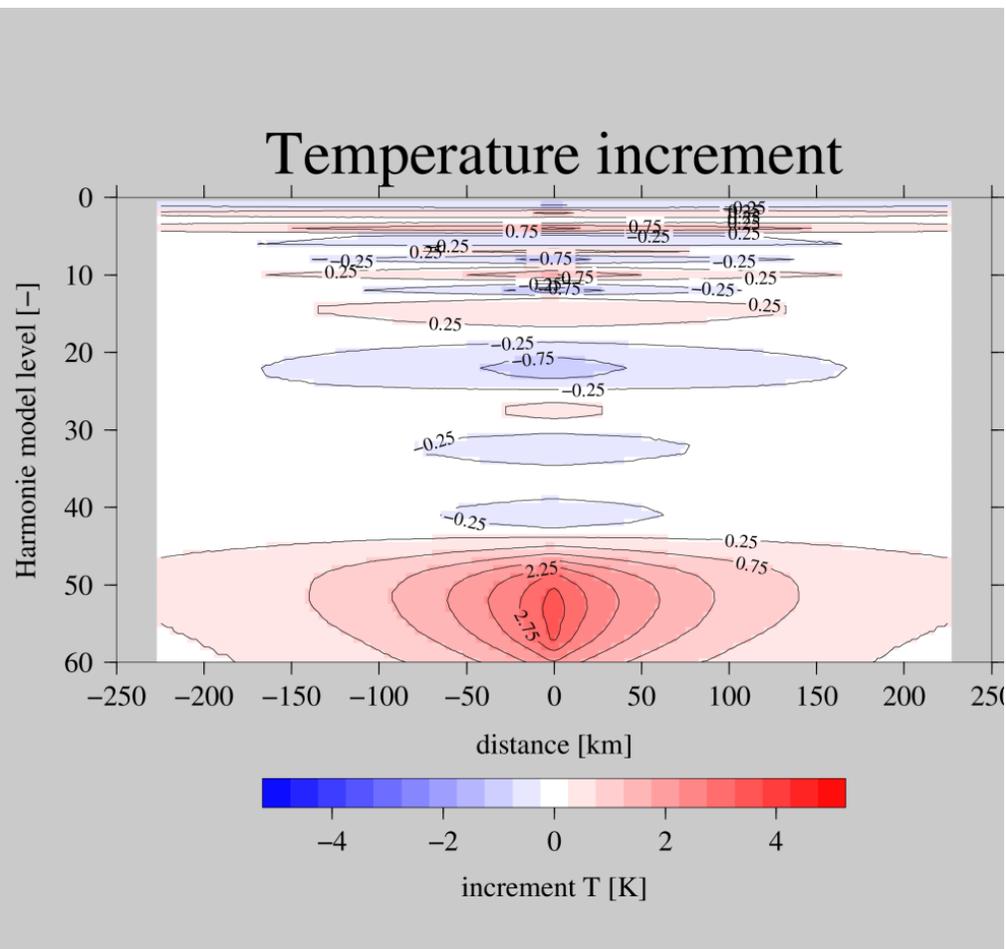
# Location of the single level 2 profile: Altenstadt, Germany



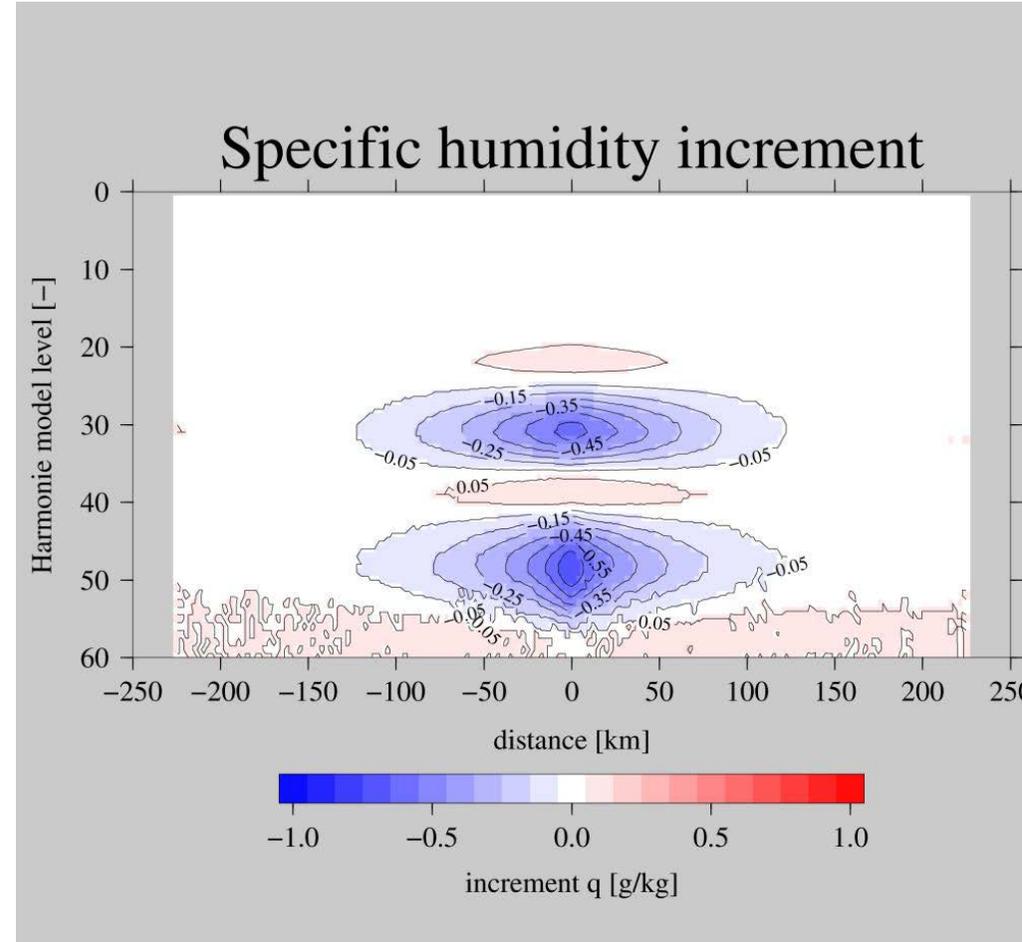
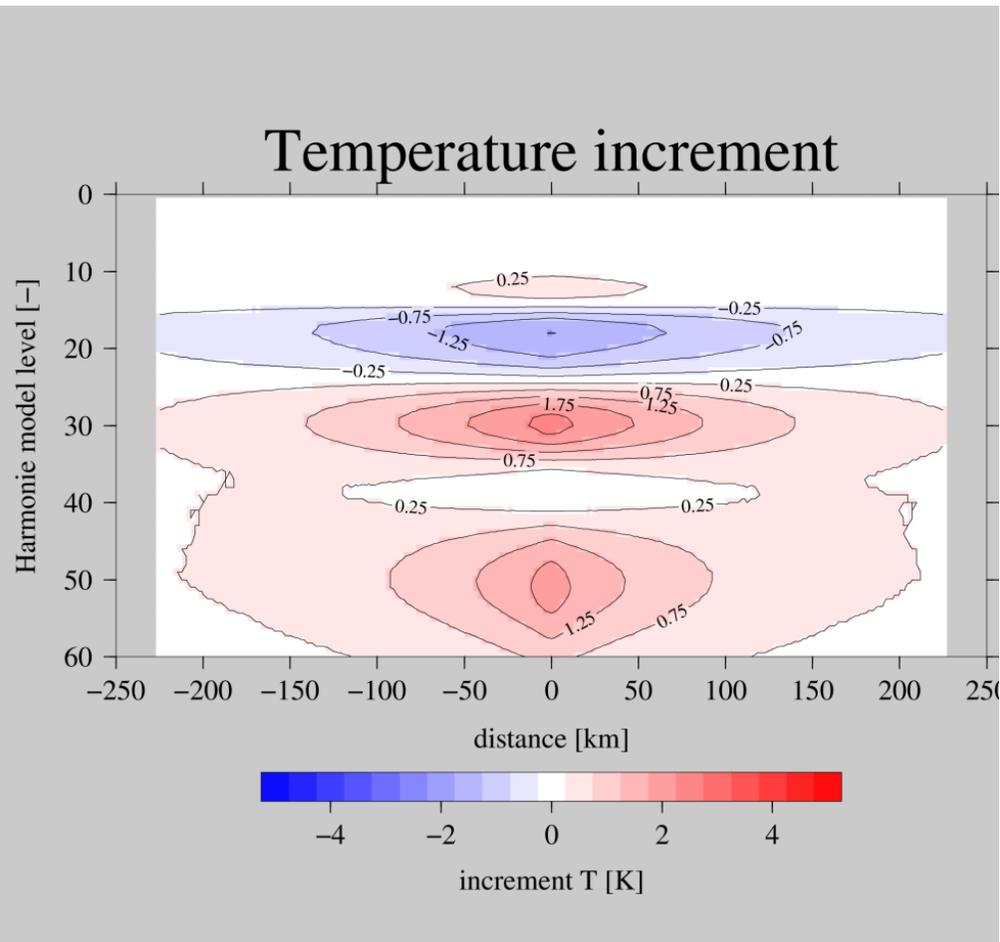
# Comparison to collocated RS of Altenstadt Germany



# Increment of T/q assimilation



# Initial results projected state assimilation



# Summary

- Introduced some results of to prepare the NWC community of the upcoming MTG-IRS era.
- Further details in posters:
  - The MTG-IRS Level 2 Processor: Background
  - The MTG-IRS Level 2 Processor: Data Assimilation