TOPROF WG 3:
Ground-based microwave radiometers

Nico Cimini[1], Ulrich Löhnert[2] and many others

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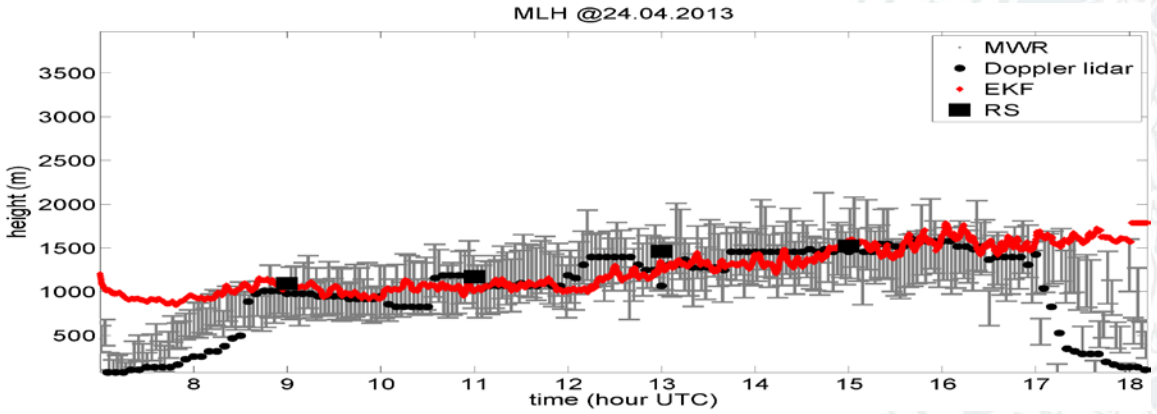
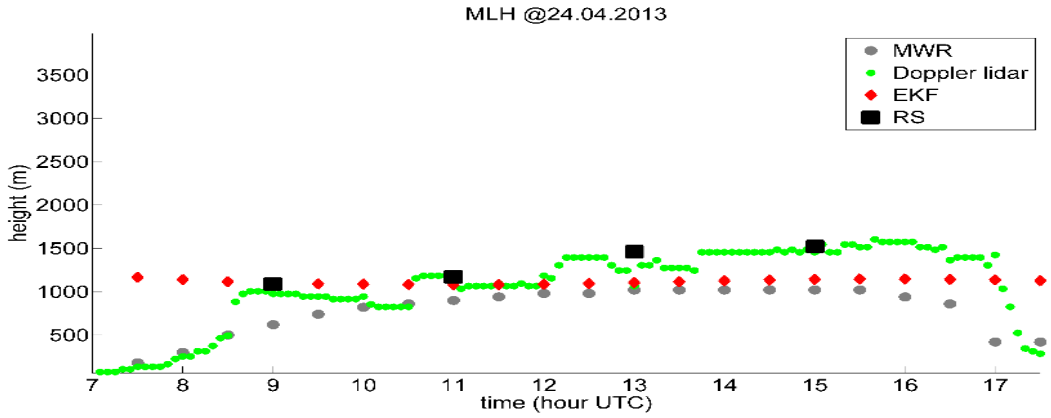
[2] University of Cologne, Germany

Mixing layer height retrieval





by Umar Saeed

- **combines** MWR and ceilometer is an KF-Filter approach; DL as evaluation
- Plans to use MWR Tbs in a direct approach (variational scheme)

possible STSMs: Saeed → UC
Saeed to participate at Mac Head?

RTTOVgb

- uncertainties specified
- comparisons to other RT models sufficient
- next official RTTOV release in April 2016 → resolve issues with MetOffice
  - extension to elevation angles below 16°
  - include broadband IR measurement (?)

RTTOVgb 1DVAR

- very promising (quality and speed) for T, H and liquid clouds in an OSSE setup → MWR provide significant updates to model background
- RTTOV_K successfully developed & installed
- next steps:
  - apply to cases where model and obs. differ concerning clouds
  - apply to real data

suggested SWG (or STSM) late spring/ early summer 2016

O-B

- O-B stat. at Payerne over 1 year show that MWR can evaluate / improve forecasts in the PBL
- bias correction applied wrt radiosondes
- discussion on observation operators → need to correctly specify the errors (error covariances) associated with the retrievals
- what efforts are need to operationally implement a new observation type together with associated error? → PM will inquire at ECMWF
- OC can provide model output from AROME for 6 core stations of MWRnet to perform O-B statics for one year; evaluation similar to Payerne analysis (Action on UL, OC, AH)

O-B

- agreed on common content, format, file naming for model files → corresponding to CF and HD(CP)2 netcdf conventions
- still need to clarify data contents and types of future **operational data flow** together with users, operators and manufacturers (i.e. make consistent with existing satellite data applications)

proposed SWG in March 2016 at Meckenheim RPG

JCAL-2: calibration and uncertainty

- automatic calibrations of HATPROs: sky-tipping and noise diode
- sky-tipping vs. LN2 comparisons very promising: possibility to test which calibration performs best
- instrument dependent! → NK to send around instructions and simple software for each user to test what kind of noise diode calibration settings are needed to to which degree absolute calibrations agree; make available via MWRnet website
- error specification for each instrument
- issues with low-opacity V-band channels remain
- development of new calibration load (RPG) to avoid standing wave and LN2/air interface reflections

Other

- **Handbook / User guide** to be made available on-line as a living document for users in the next weeks (BP)
- Radiofrequency protection: ever growing problem
  - be active via WMO Steering group on radio frequency
  - support inputs for ITU protected bands
  - MeteoSwiss (AH, MH) actively participating and will ask WG3 for necessary inputs
  - WRC: World Radiation Conference 2019