

MTG-IRS L2 data assimilation into the ECMWF model

Progress report 13.6.2018

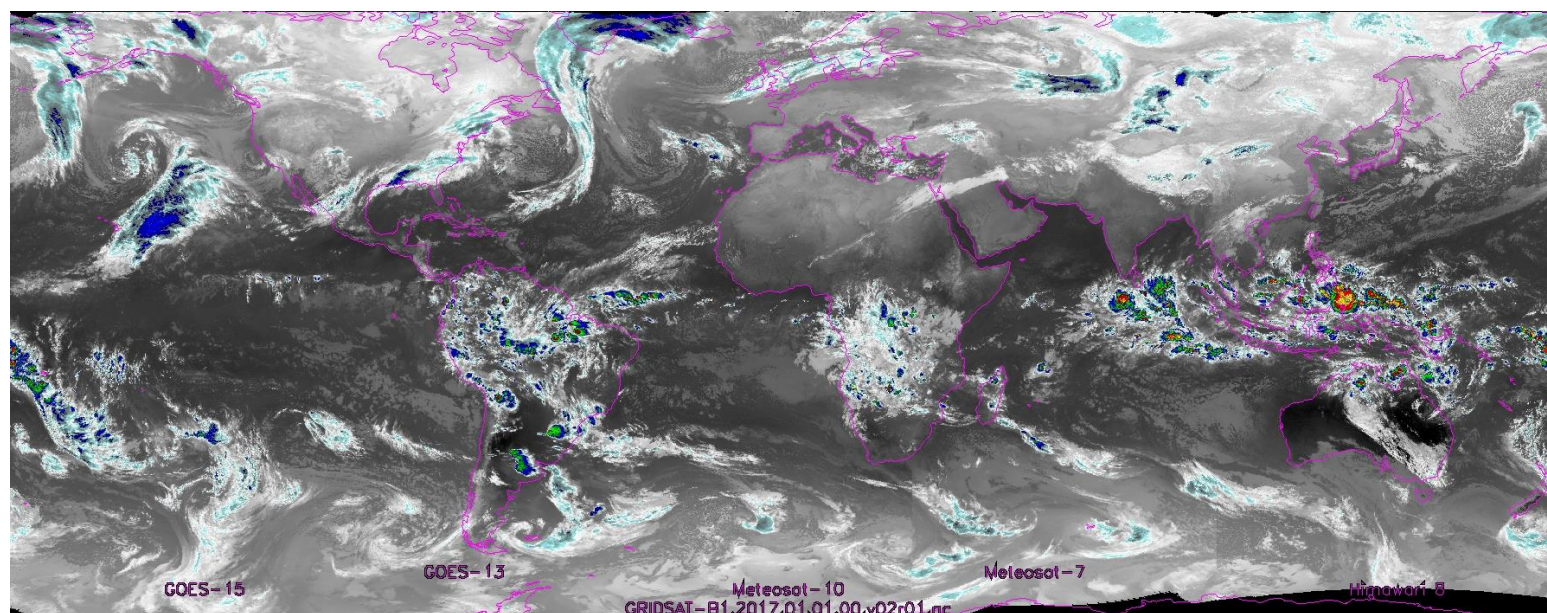
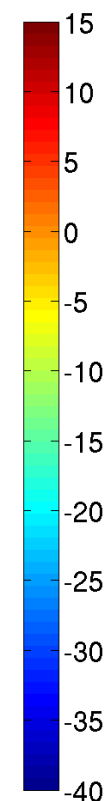
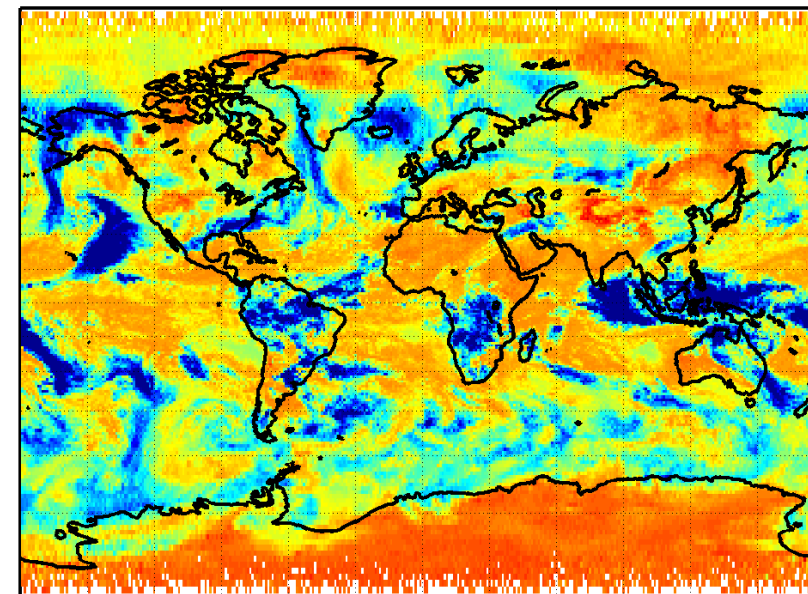
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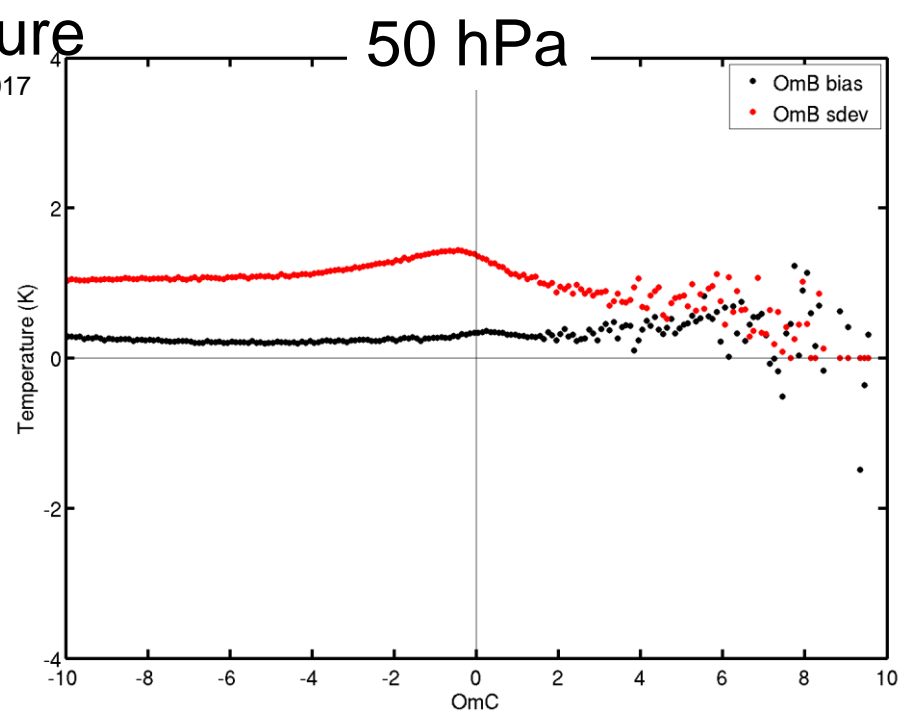
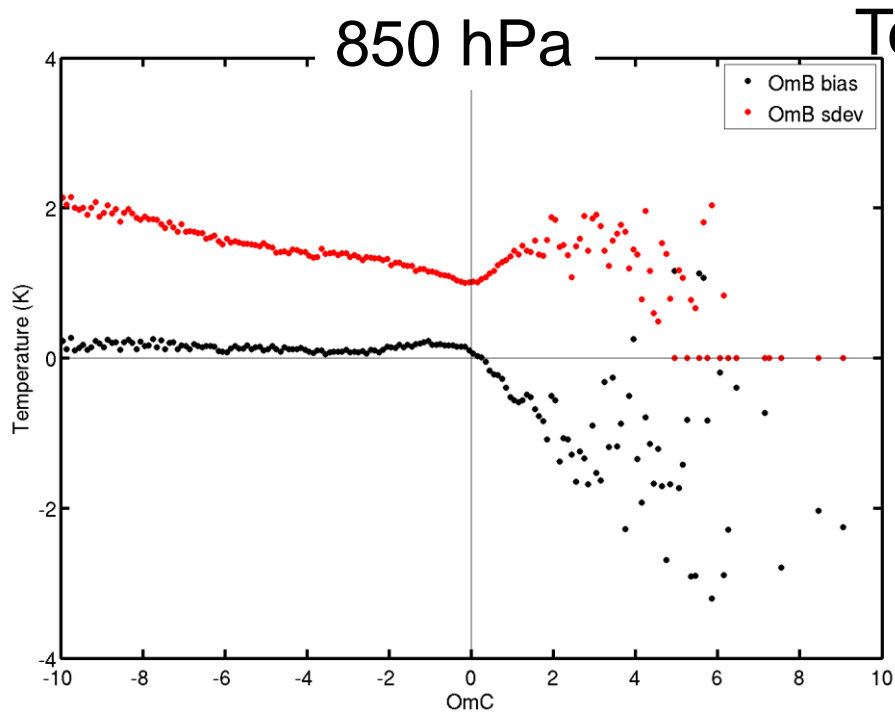
Status

- Technical preparations for passive monitoring of L2 temperature, specific humidity and O₃ profiles are completed (branch of IFS cycle 45R1).
- 1 year of IRON and MWIR retrievals have been archived to ecfs.
- Processing of 1 year of IRON data to ODB is ongoing
 - Pre-screening: select randomly 1 out of 4 profiles (resulting to ~14 G ODB file / 12-hour assimilation window)
 - All variables (except mdist, CLS) are included in ODB and archived. Thus, can be used in validation phase if/when required.
- Passive monitoring experiment is running 1.1.2017 ->
- The following monitoring plots are covering 6 days and at this point primarily aimed as a demonstration that the technical infrastructure is in place and working.

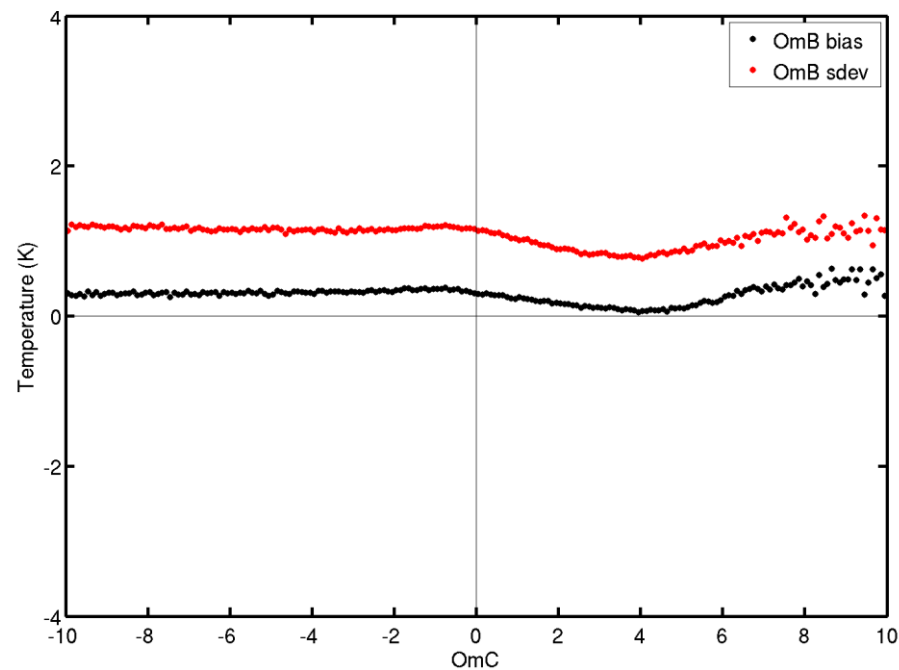
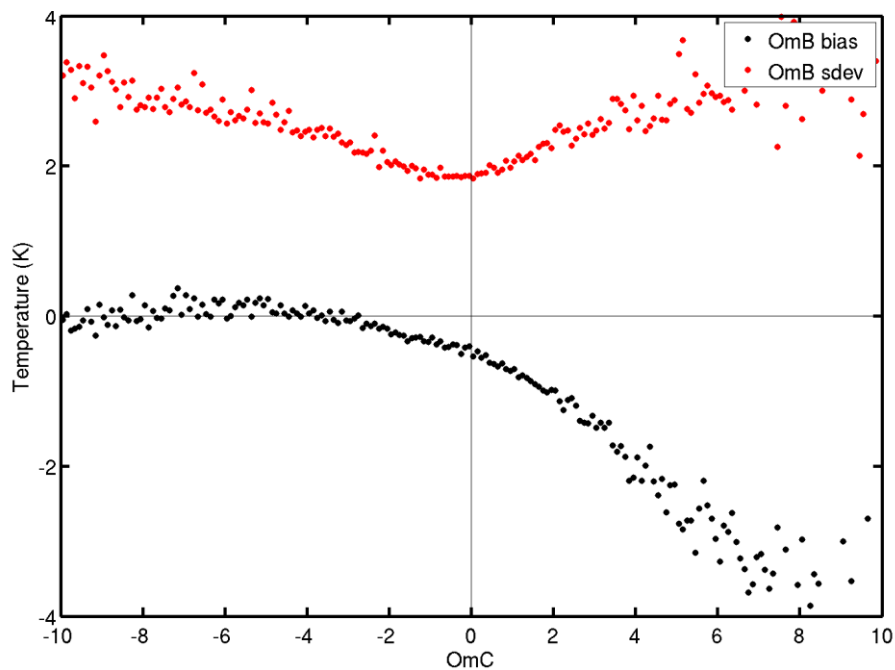
1.1.2017, Satellite image and OmC (obs – calc)



Sea

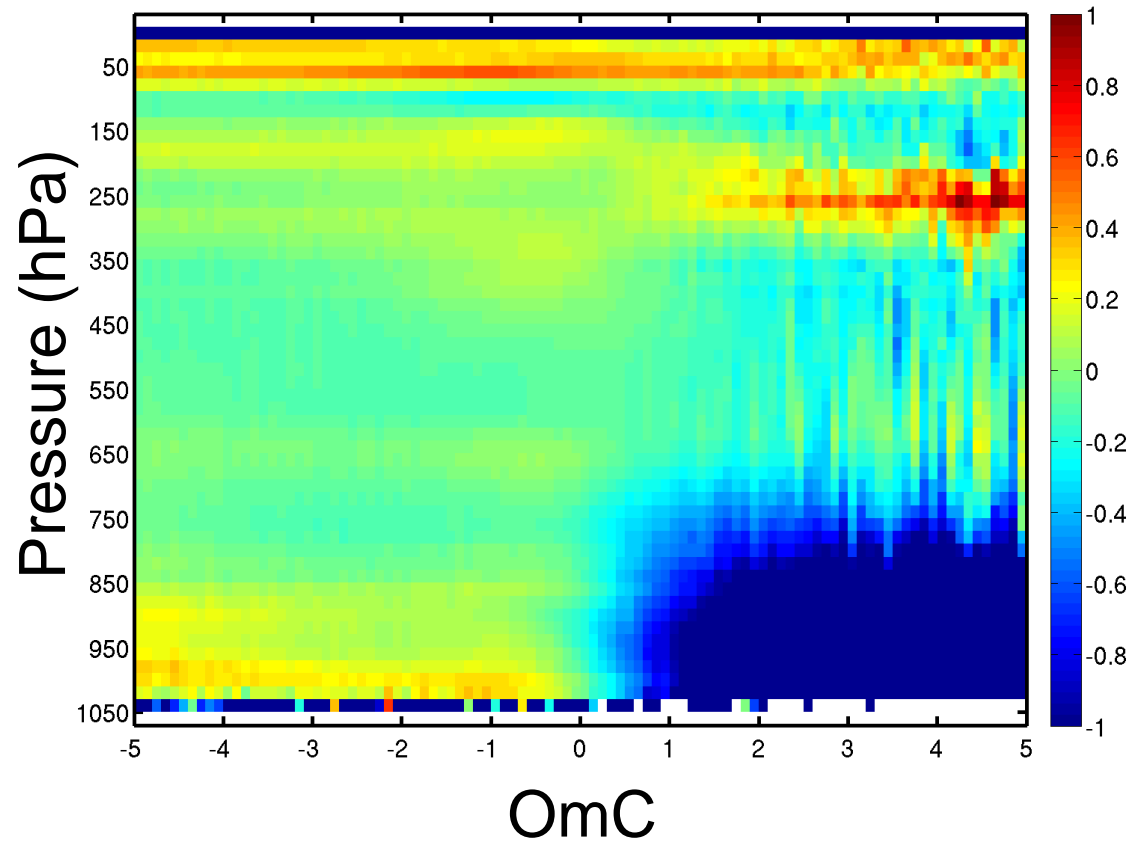


Land

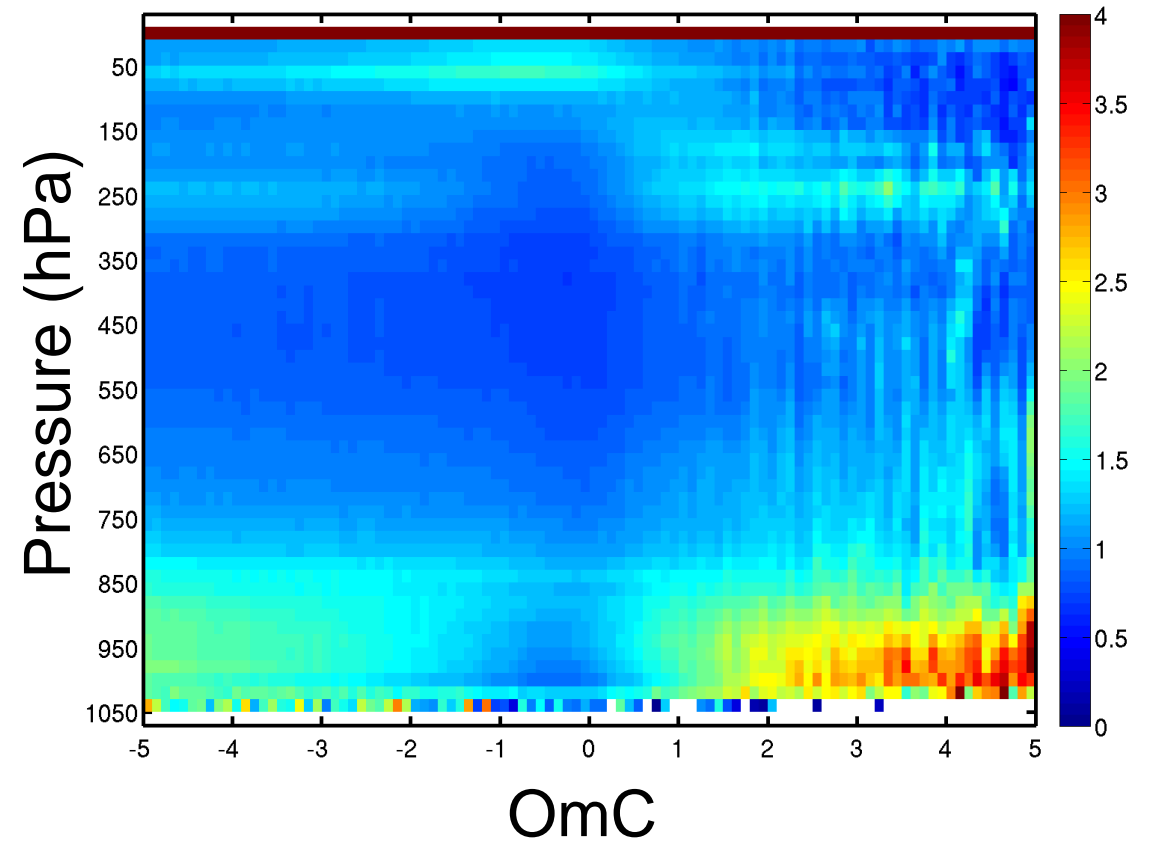


Temperature OmB statistics vs OmC, sea (Statistics 1.-6.1.2017)

OmB bias, sea

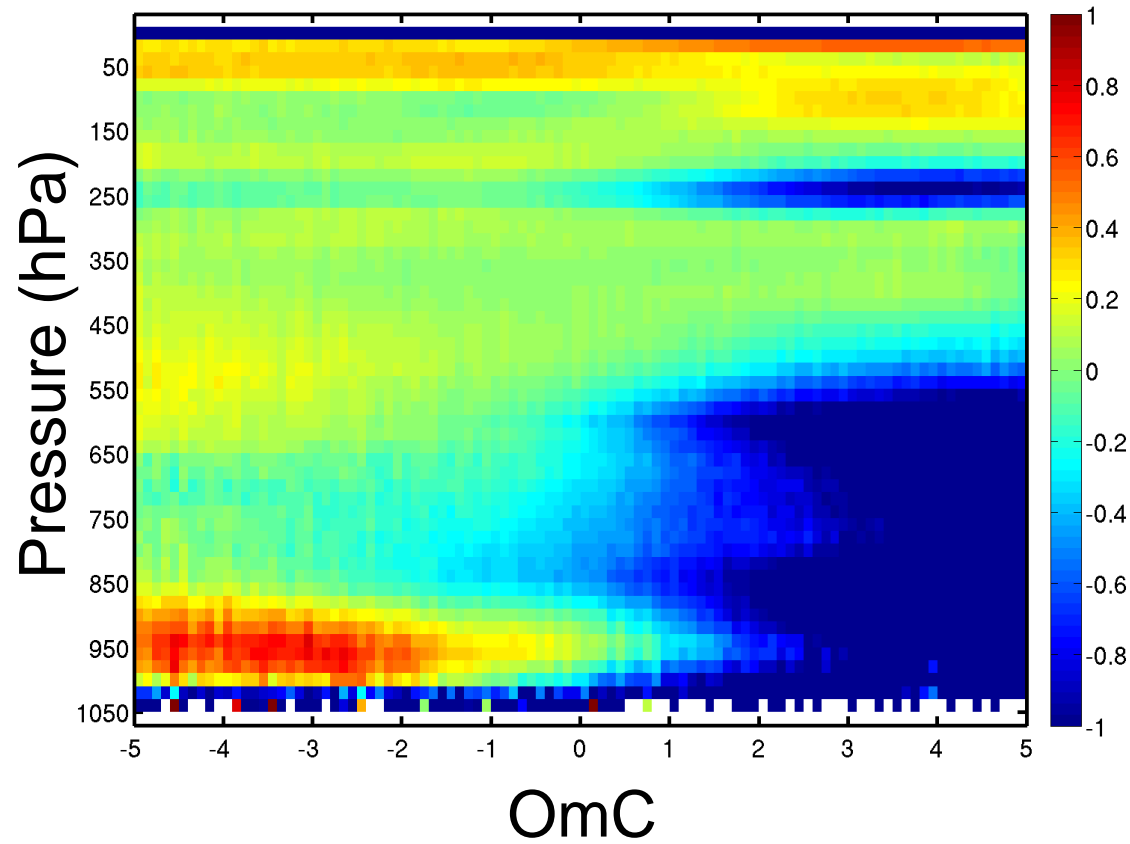


OmB sdev, sea

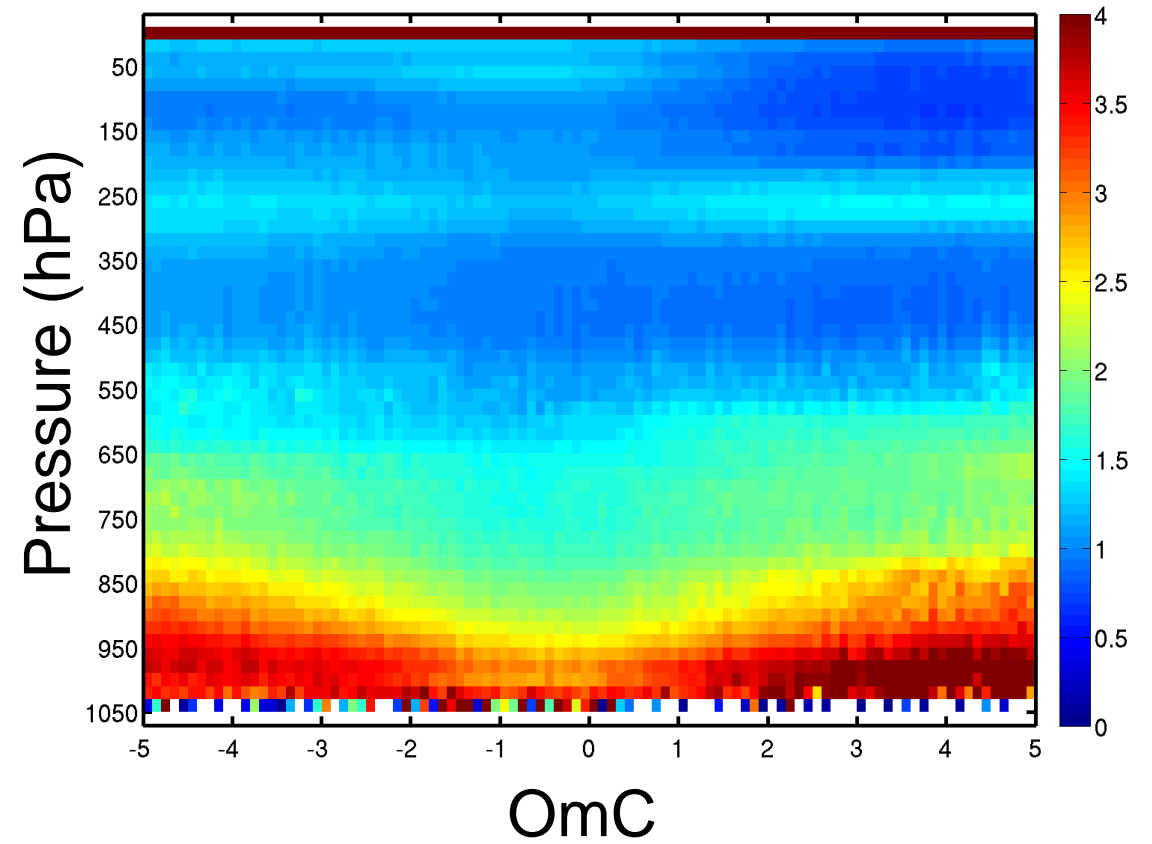


Temperature OmB statistics vs Omc, land (Statistics 1.-6.1.2017)

OmB bias, land

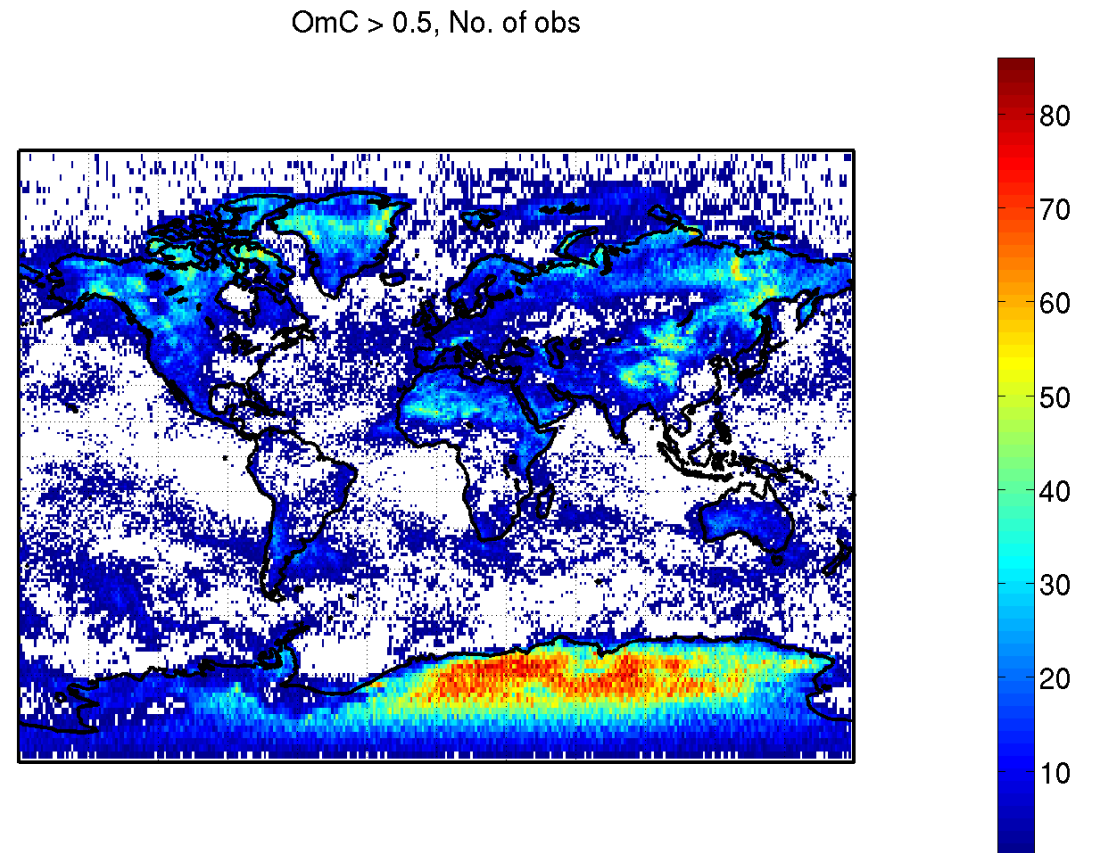


OmB sdev, land



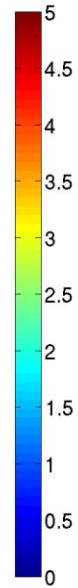
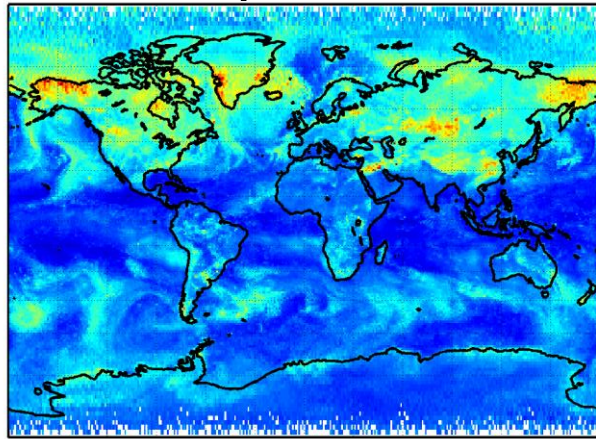
From where OmC > 0.5 observations originate

- Majority over land and over cold surfaces at high latitudes.
- But why also elsewhere?

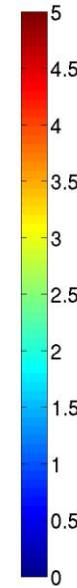
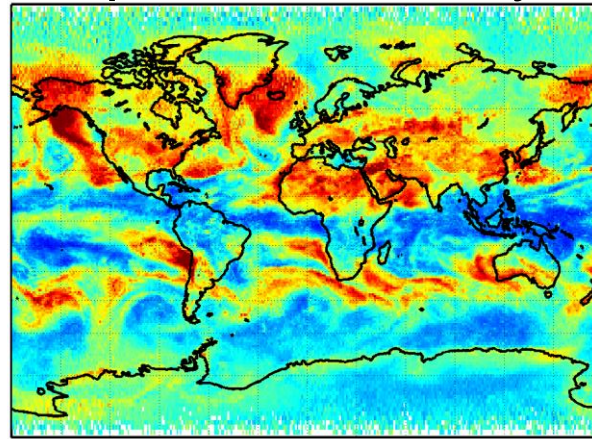


1.1.2017, quality indicator

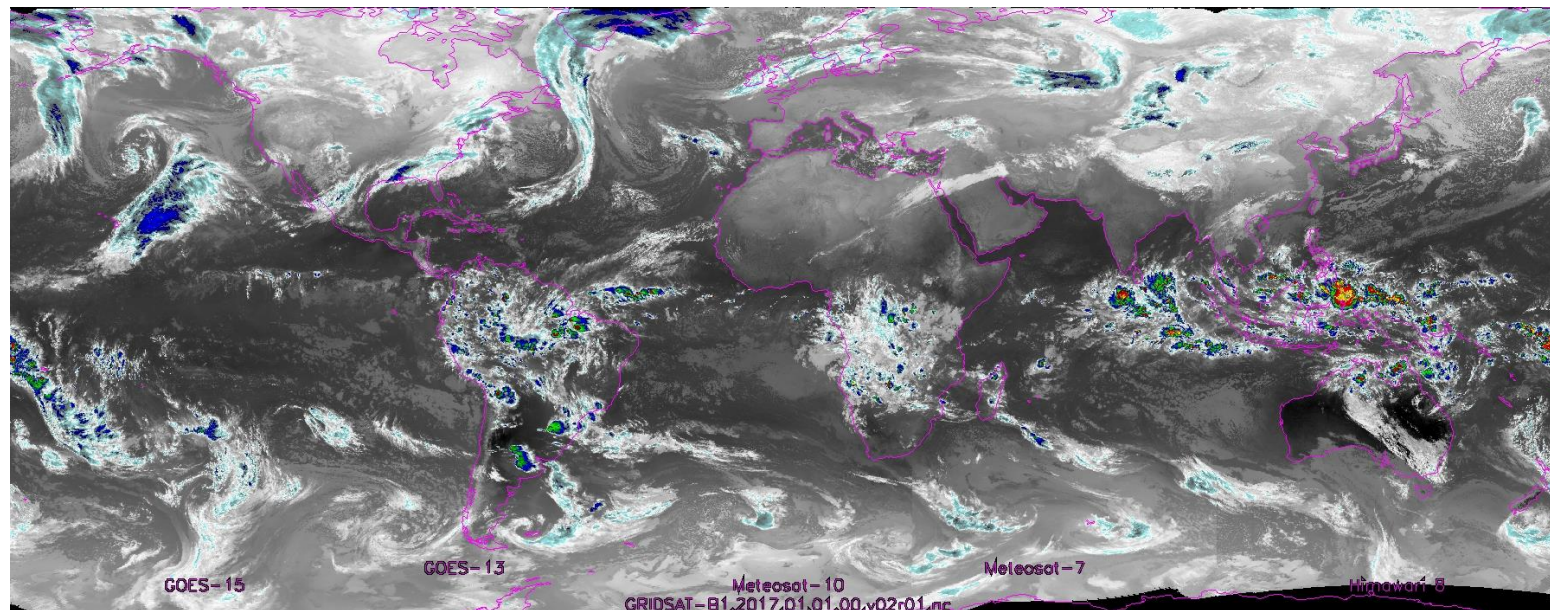
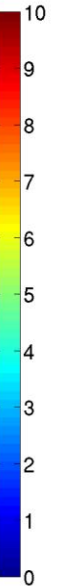
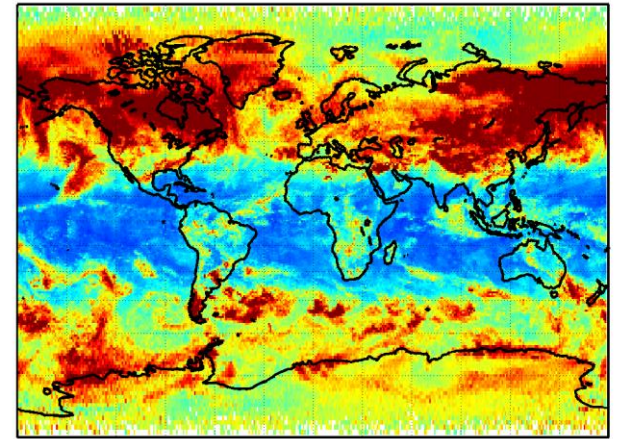
Temperature



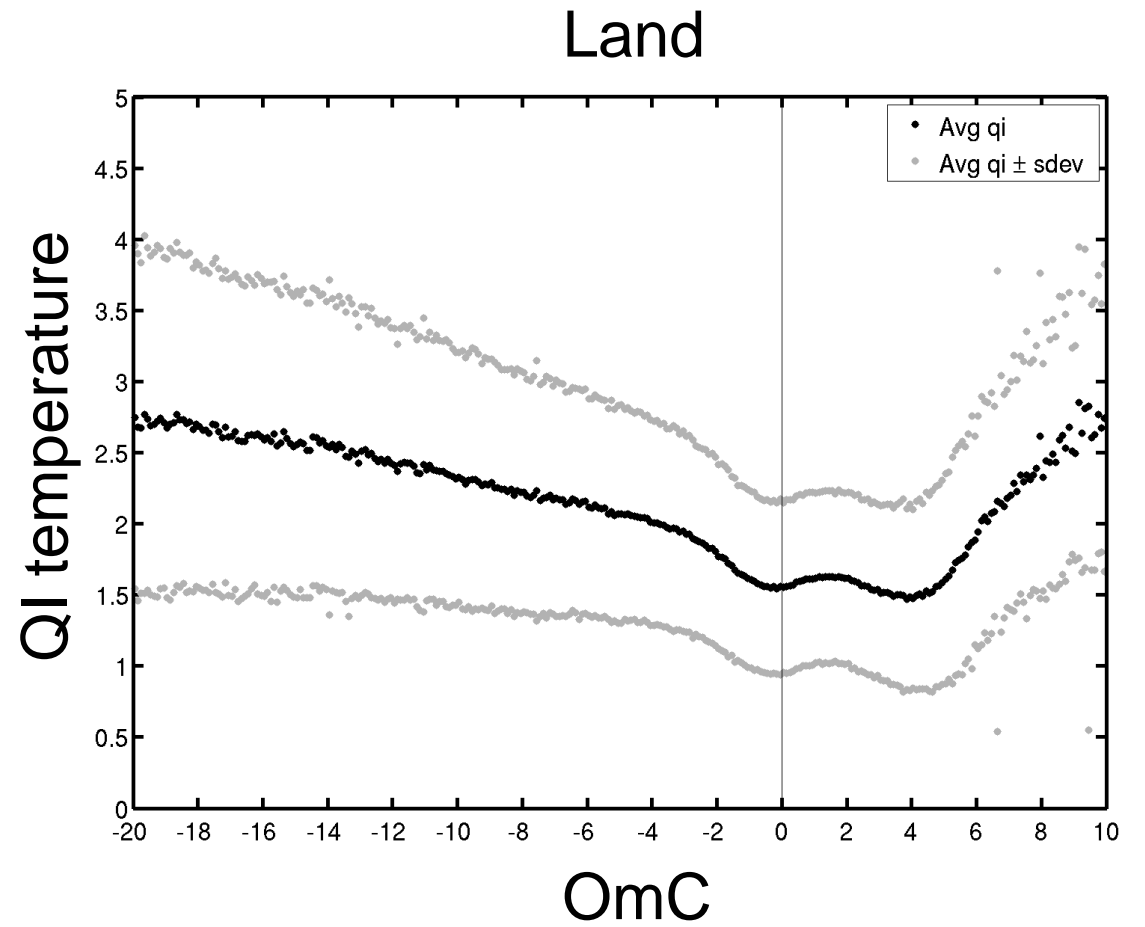
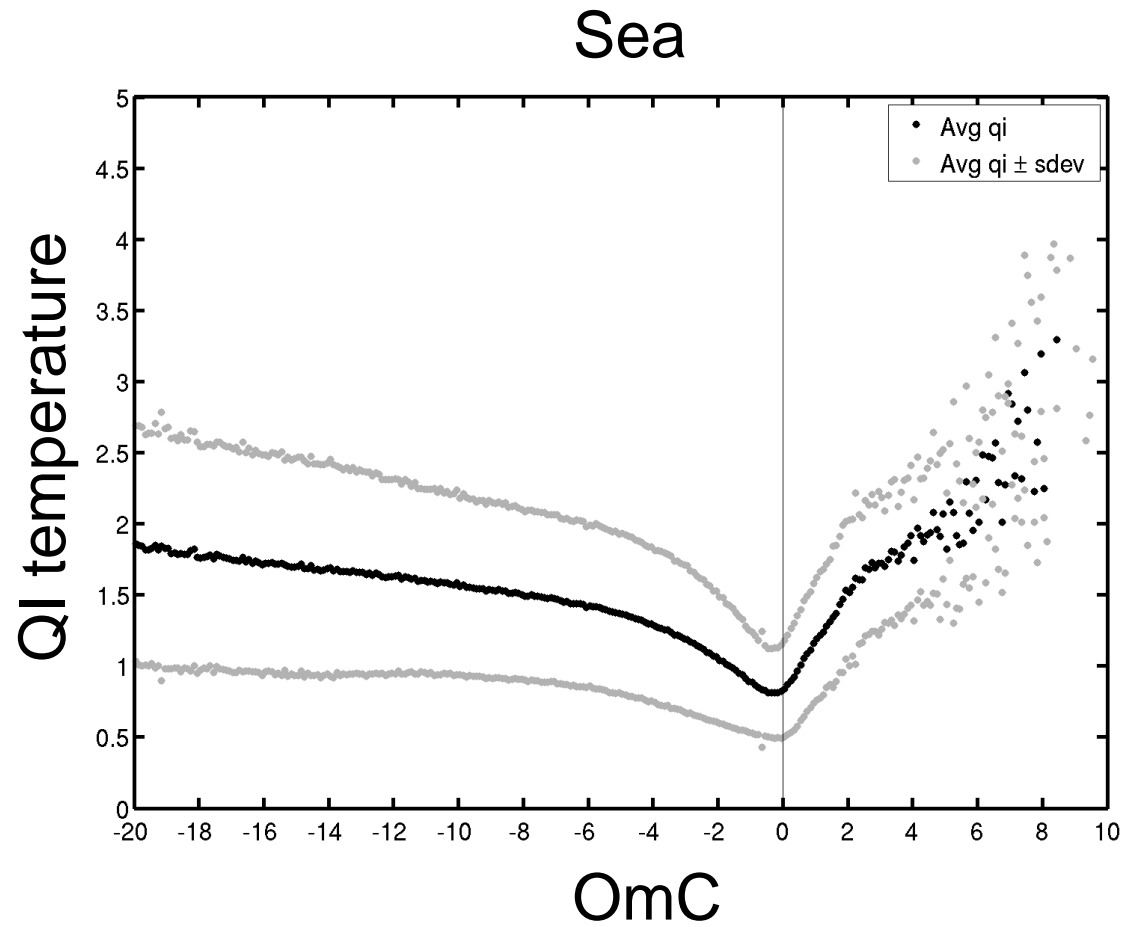
Specific humidity



Ozone



QI and OmC (Statistics 1.-6.1.2017)

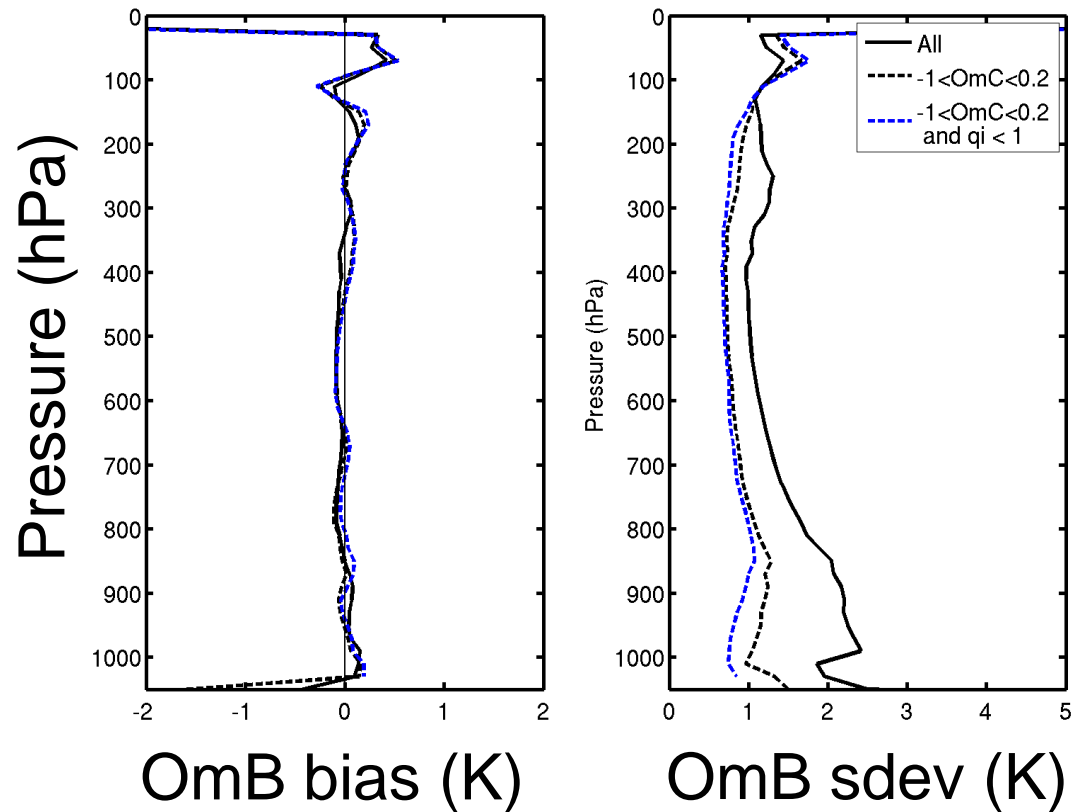


OmB statistics for temperature (Statistics 1.-6.1.2017)

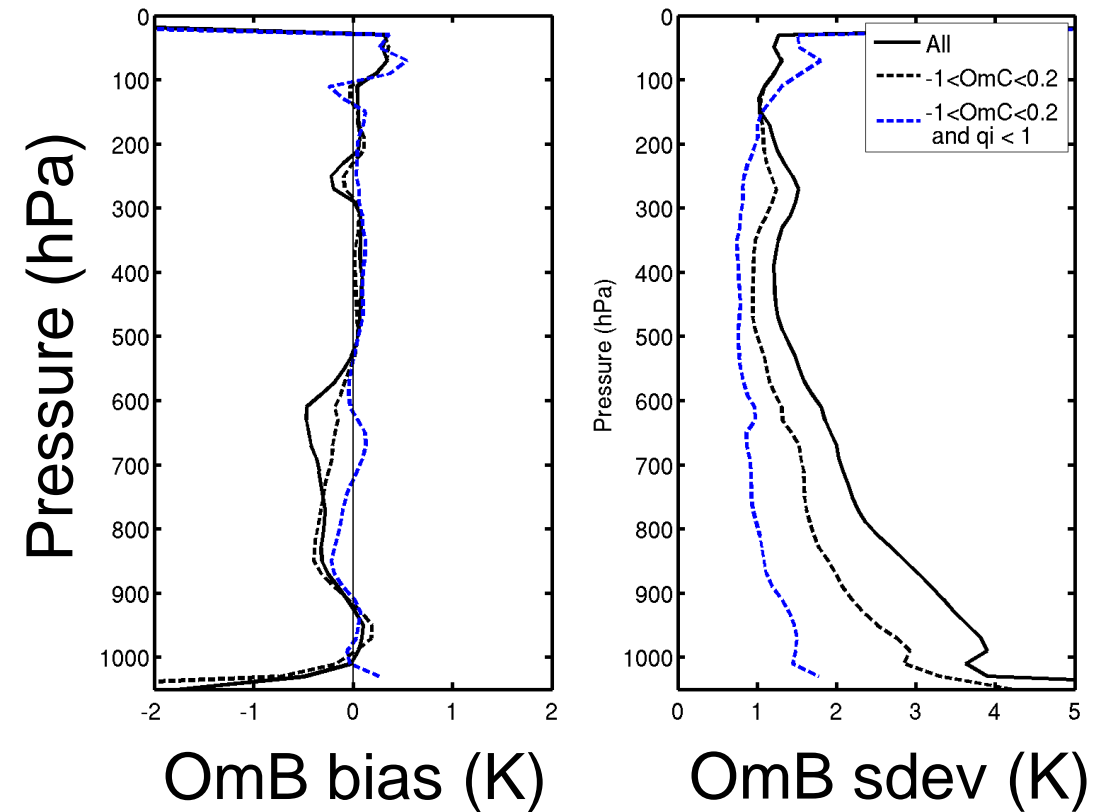
$-1 < \text{OmC} < 0.2 \sim 13\%$ of all data

$-1 < \text{OmC} < 0.2$ and $q_i < 1 \sim 2\%$ of all data

Temperature, sea

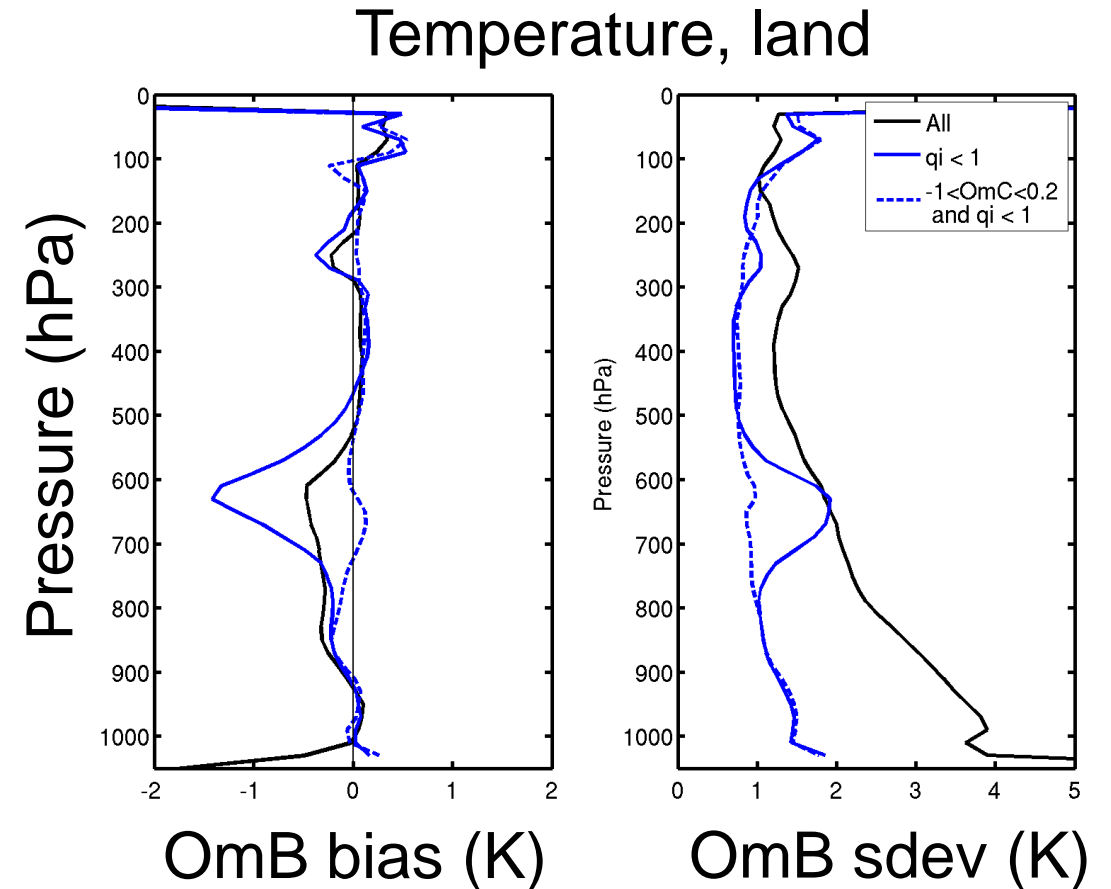


Temperature, land

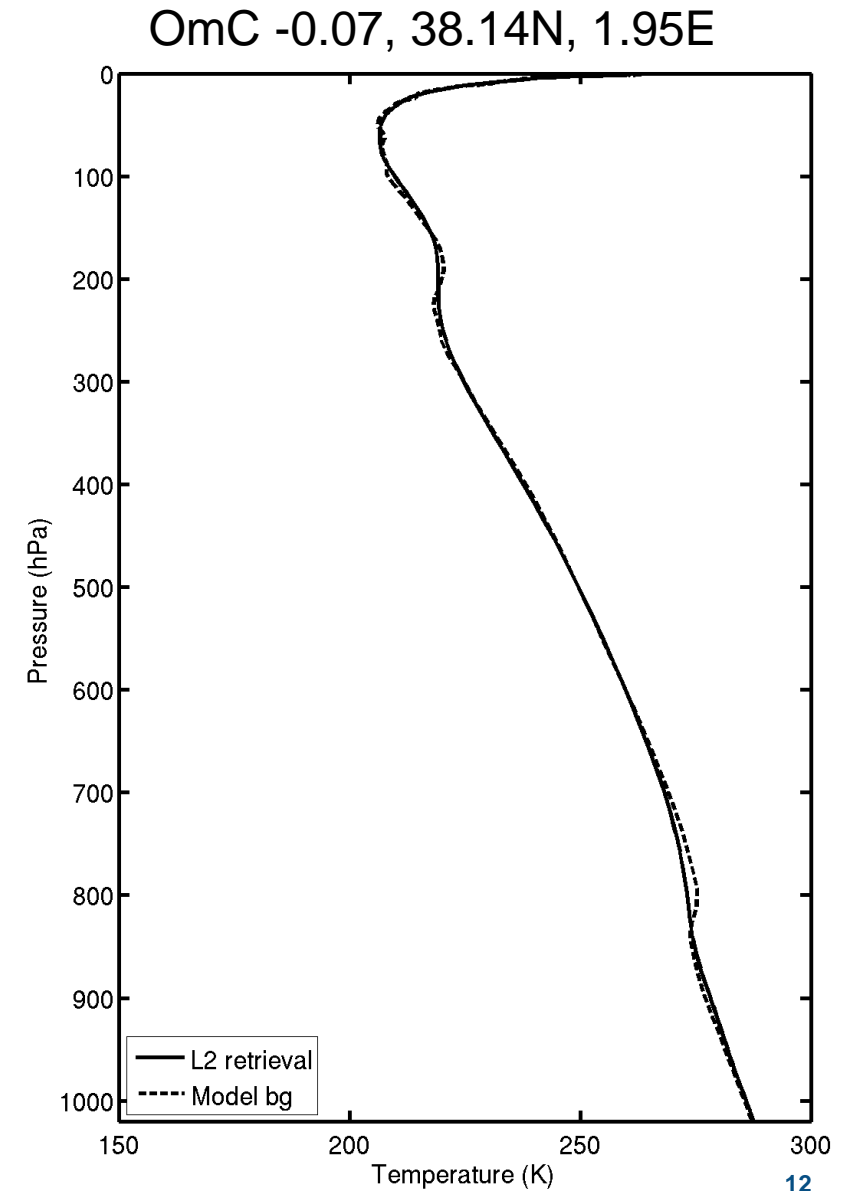
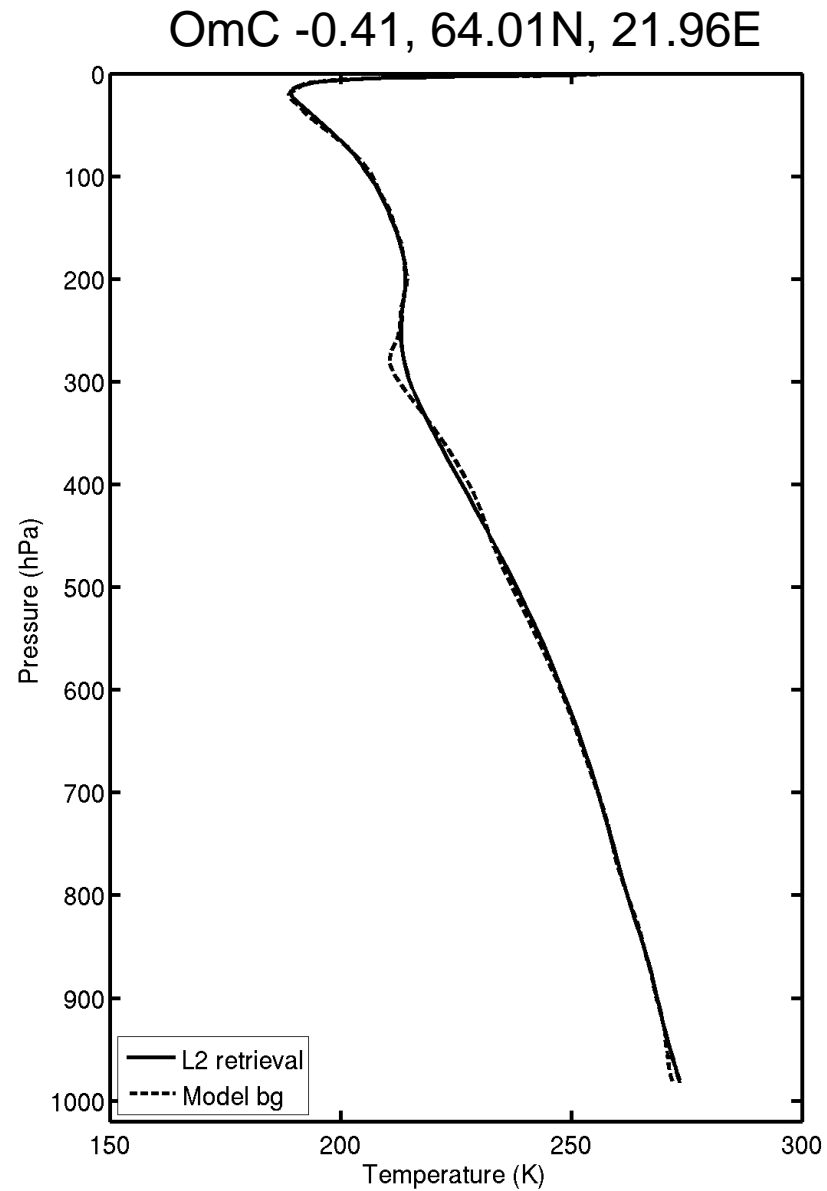


OmB statistics for temperature (Statistics 1.-6.1.2017)

- $q_i < 1$ ~32% of all data
- Signal from cloud when only q_i criteria is used to select data?
- Using tight criteria for OmC and q_i rejects 98% of the data, that is too much.



1.1.2017 12 UTC, example profiles over sea, $-0.5 < \text{omc} < 0$



Findings/questions

- OmC has a good fit with cloudy areas
 - OmC > 0: not good data quality in terms of OmB statistics
- How the qi values have been calculated?
- First impression is that the profiles are quite smooth, missing inversion layers and having smooth tropopause.