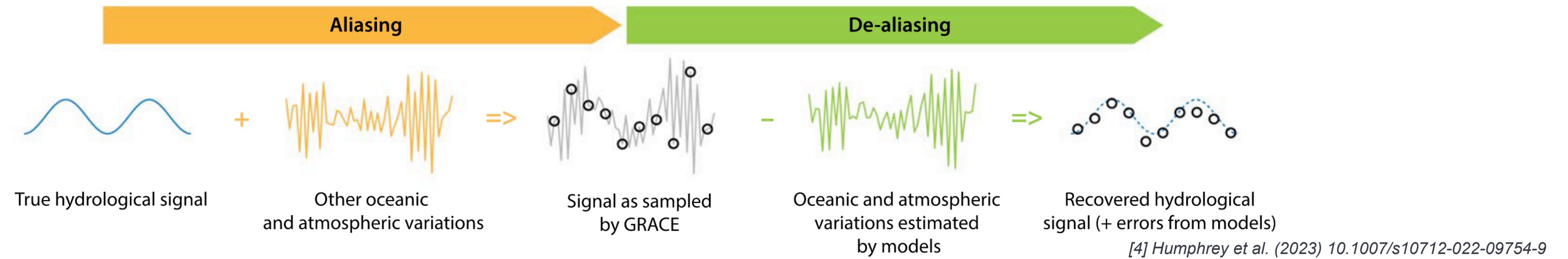# Status of AOD1B

8. Oct. 2023

L. Shihora, K. Balidakis, R. Dill, H. Dobslaw
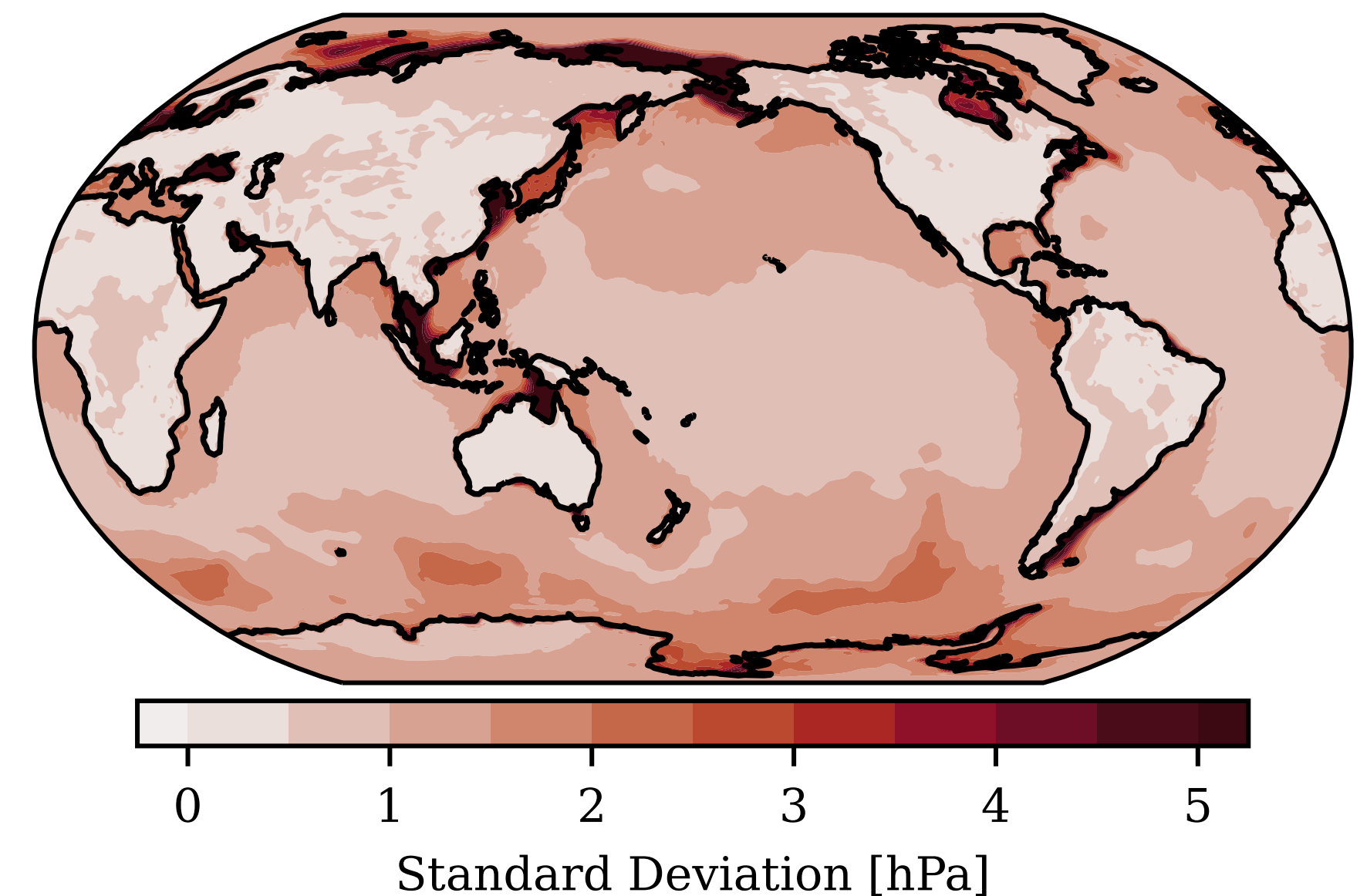
German Research Centre for Geosciences, Potsdam, Germany

Atmosphere and Ocean De-Aliasing Level-1B Product

Aliasing → De-aliasing

True hydrological signal + Other oceanic and atmospheric variations => Signal as sampled by GRACE − Oceanic and atmospheric variations estimated by models => Recovered hydrological signal (+ errors from models)

[4] Humphrey et al. (2023) 10.1007/s10712-022-09754-9

- RL07 available and operational

- RL06 still in operational production as long as GRACE solutions based on RL06 are produced

- AOe07 available for 21 years together with static VCM

- Next steps:

  - Time-variable error VCM ?

  - Technical improvements and monitoring

AOe07 Error Time-Series
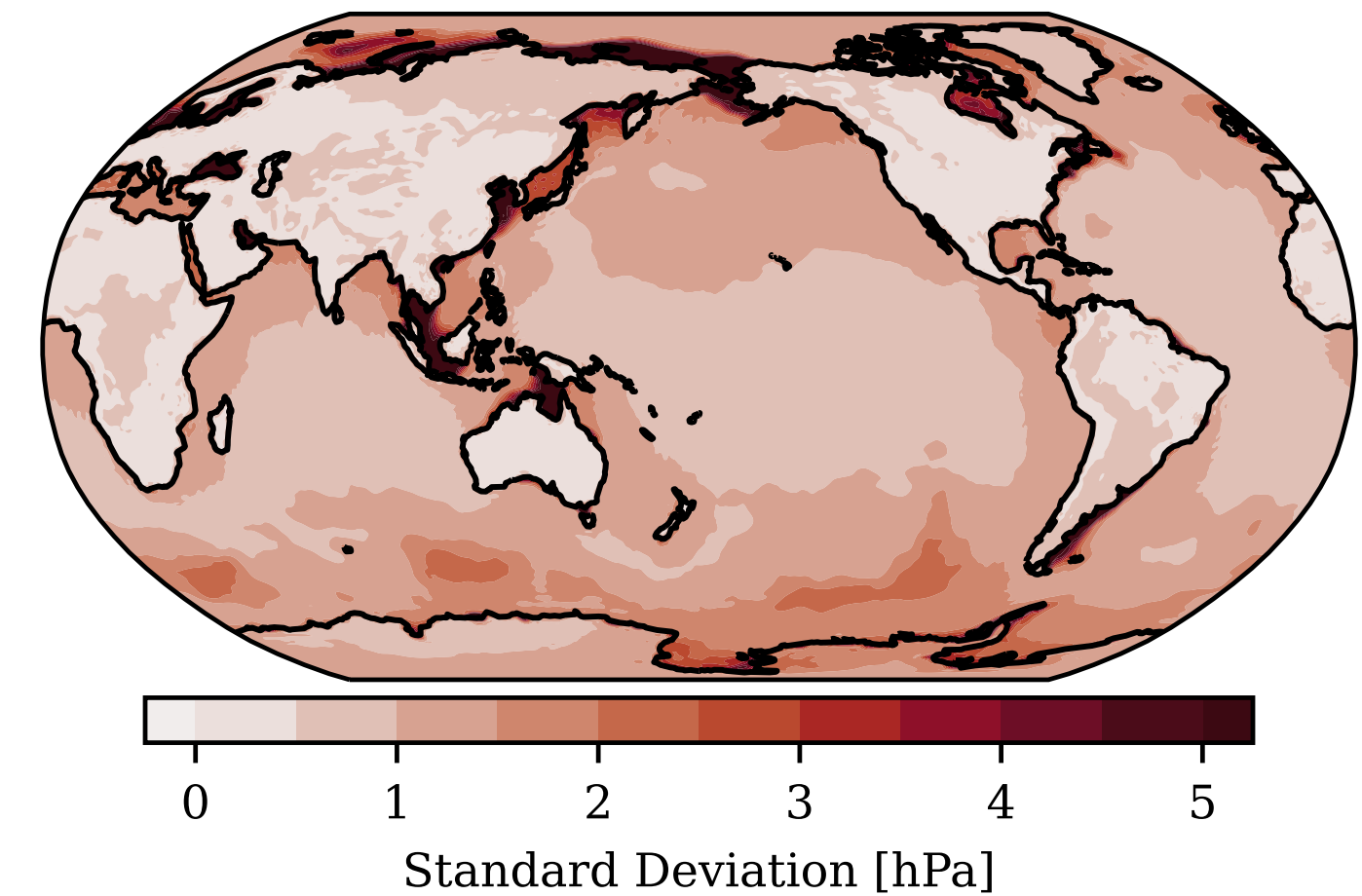
Standard Deviation [hPa]

AOe07 and Variance-Covariance Matrix

- AOe07 & VCM error time-series to be used in:

  - Future mission simulations

  - Stochastic modelling of background models

- OT + AOD VCM result in reduction in RMS of up to 30% for GFZ solutions
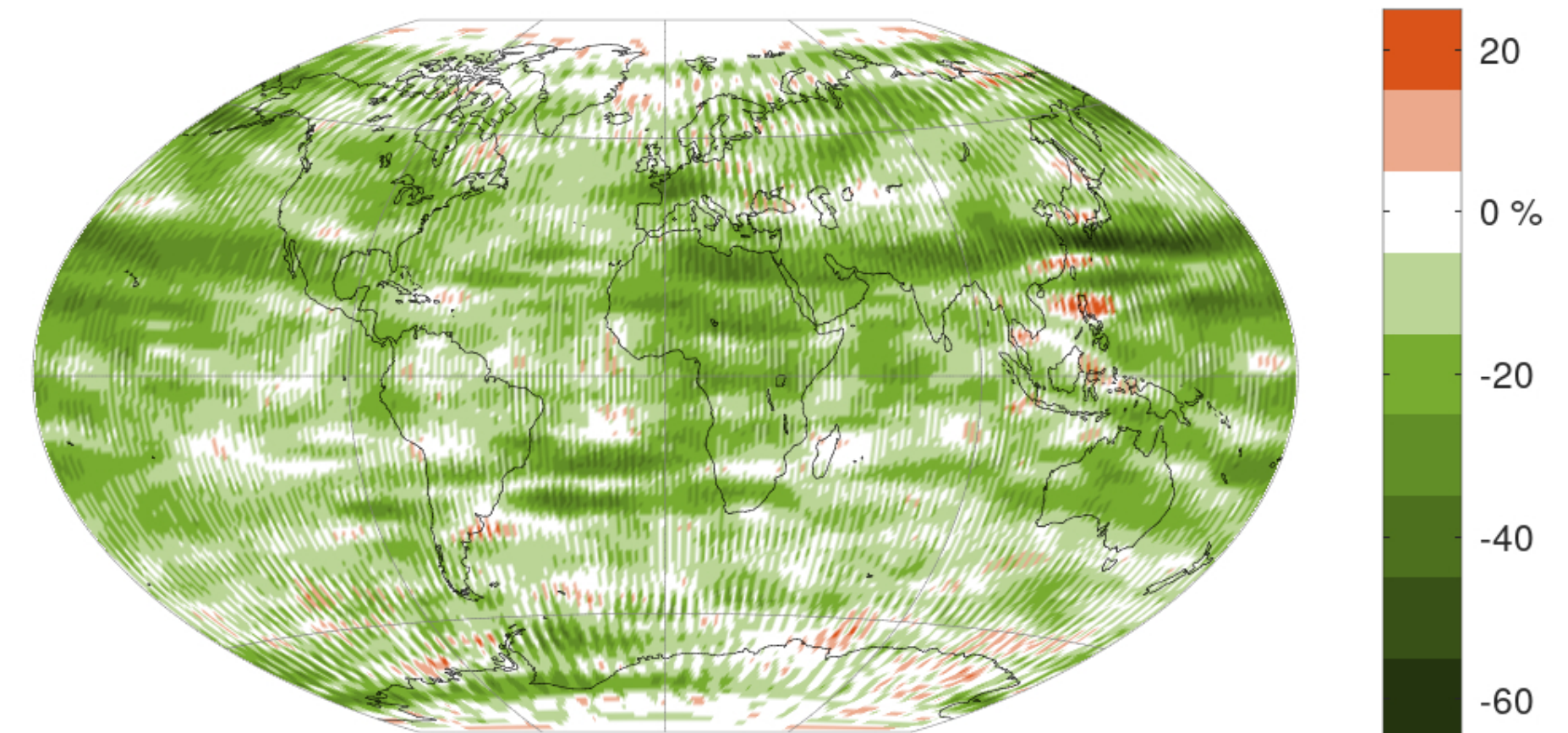
- So far only static VCM available:

$$\mathrm{cov}(X_{l_1,m_1}, X_{l_2,m_2}) = \frac{1}{N_t - 1} \sum_t (X_{l_1,m_1} - \overline{X}_{l_1,m_1}) \cdot (X_{l_2,m_2} - \overline{X}_{l_2,m_2})$$

- Additional feedback welcome
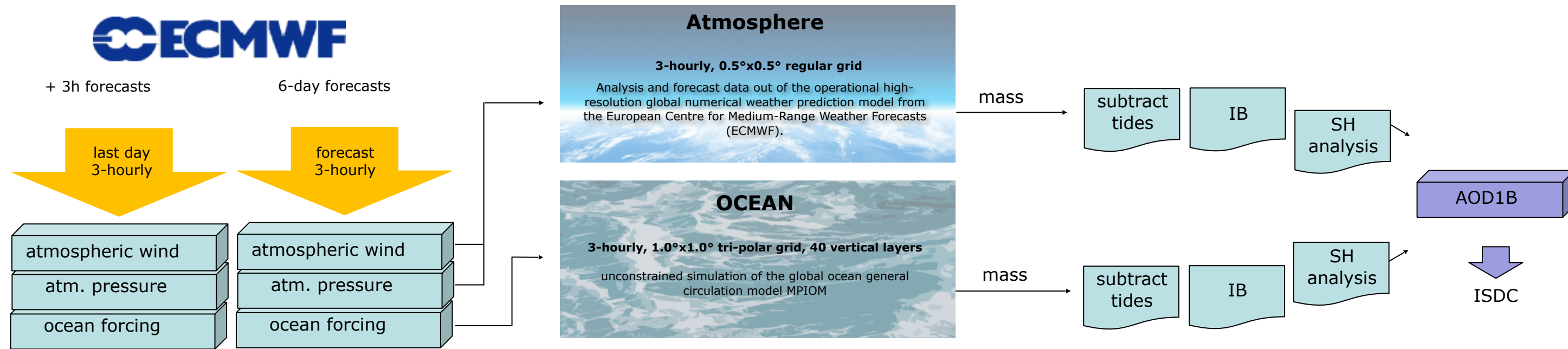- Especially on time-variable VCM

AOe07 Error Time-Series

Standard Deviation [hPa]

Impact of tidal & non-tidal stochastic modelling on GFZ solutions

Operational Processing & Change-Log

AOD Processing Workflow

Change-Log

```
######## Logfile for re-uploaded files ########
#
# The following files have been reprocessed and updated after the initial upload:
#
# Entry format: AOD1B_yyyy-mm-dd_X_0?.asc yyyy-mm-dd HH:MM:SS
#
AOD1B_2024-09-15_X_06.asc.gz 2024-09-20 07:26:53
AOD1B_2024-09-16_X_06.asc.gz 2024-09-20 07:28:13
AOD1B_2024-09-17_X_06.asc.gz 2024-09-20 07:29:38
AOD1B_2024-09-18_X_06.asc.gz 2024-09-20 07:24:30
AOD1B_2024-09-14_X_06.asc.gz 2024-09-16 09:06:37
AOD1B_2024-03-06_X_06.asc.gz 2024-04-23 11:04:00
AOD1B_2024-04-18_X_06.asc.gz 2024-04-22 16:43:00
AOD1B_2024-04-19_X_06.asc.gz 2024-04-22 16:33:00
AOD1B_2024-04-21_X_06.asc.gz 2024-04-22 16:26:00
```

- Products based on operational ECMWF atmospheric data

- AOD operationally produced in NRT (typically available ~ 9:00 UTC) in daily batches

- May require revisions of already published files if ECMWF updates atmospheric files

- Newly introduced change-log to communicate re-processing of existing AOD files

- Allows automated checks for users

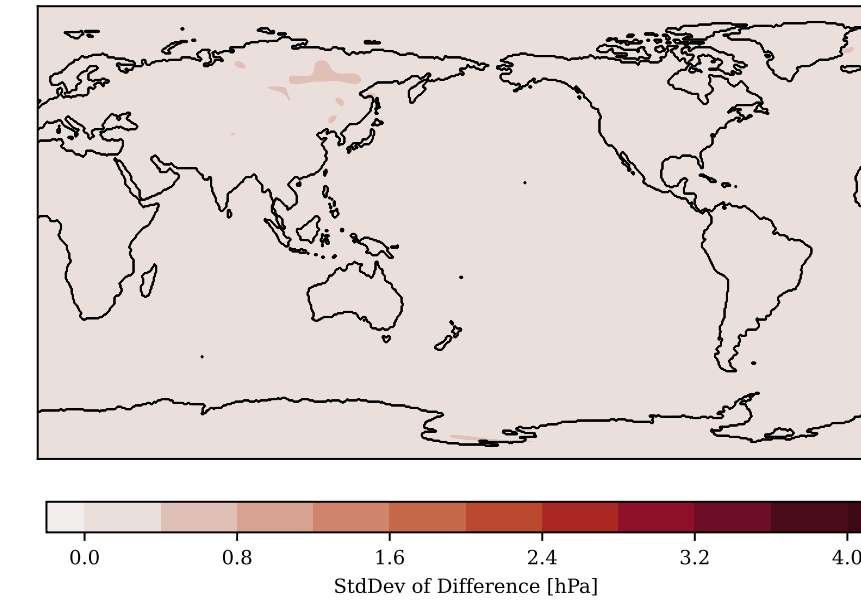- Still WIP and occasional bug-fixes are required

Outlook: Operational Stability

- Focus next on operational stability

- Update consistency checks

- Possible options:

  - Compare daily AOD field to previously produced forecast data for consistency checks

  - Tendencies

- Updates to the monitoring plots on the AOD website
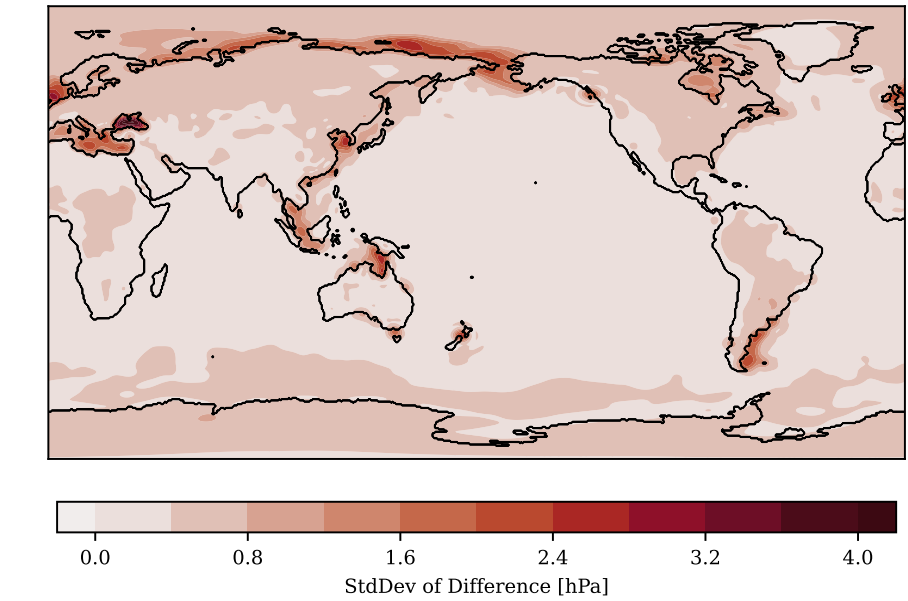
- Suggestions / comments welcome!

Thank you!

StdDev(AODF - AOD)

00:00 - day 0

00:00 - day 1

Example: Current Operational Plots