COST-G

Combination Service for Time-variable Gravity Models

COST-G: The new International Combination Service for Time-variable Gravity Field Solutions of the IAG/IGFS

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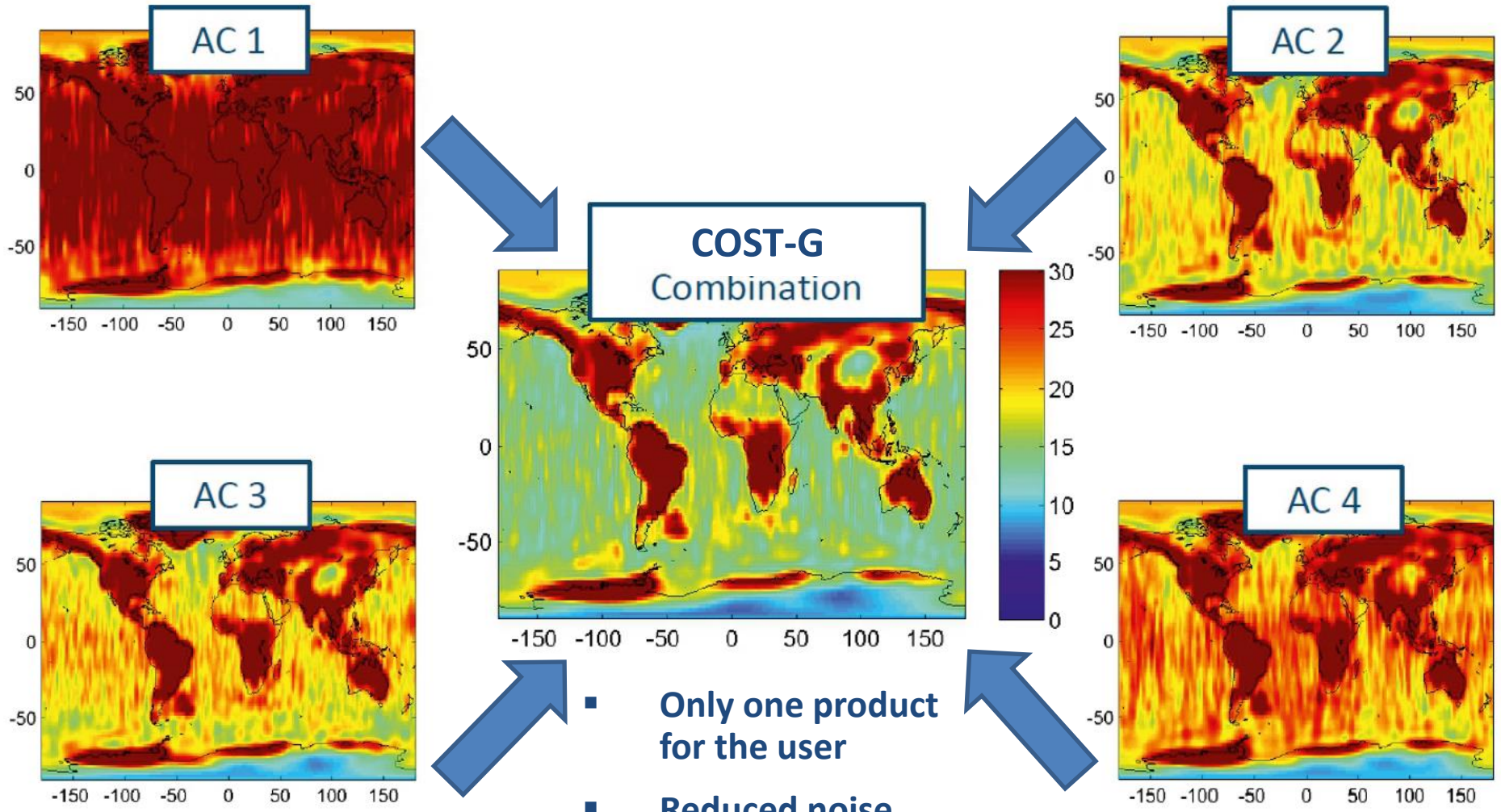
- Quality control: Signal / Noise
- GRACE-RL06
- Summary and Outlook

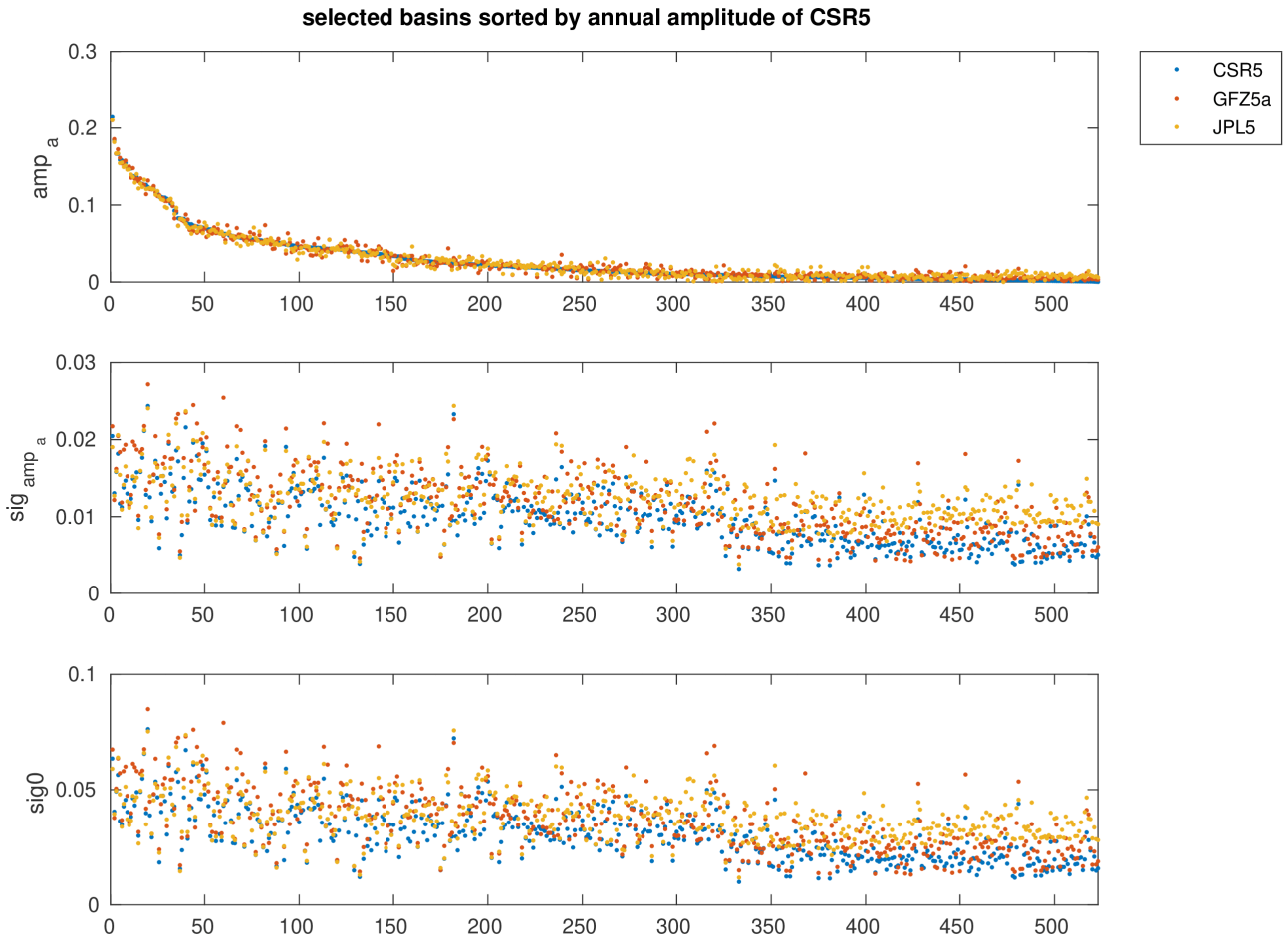
COST-G: Concept



- **Only one product for the user**
- **Reduced noise**

River Basins

Amplitude of annual variation: RL05

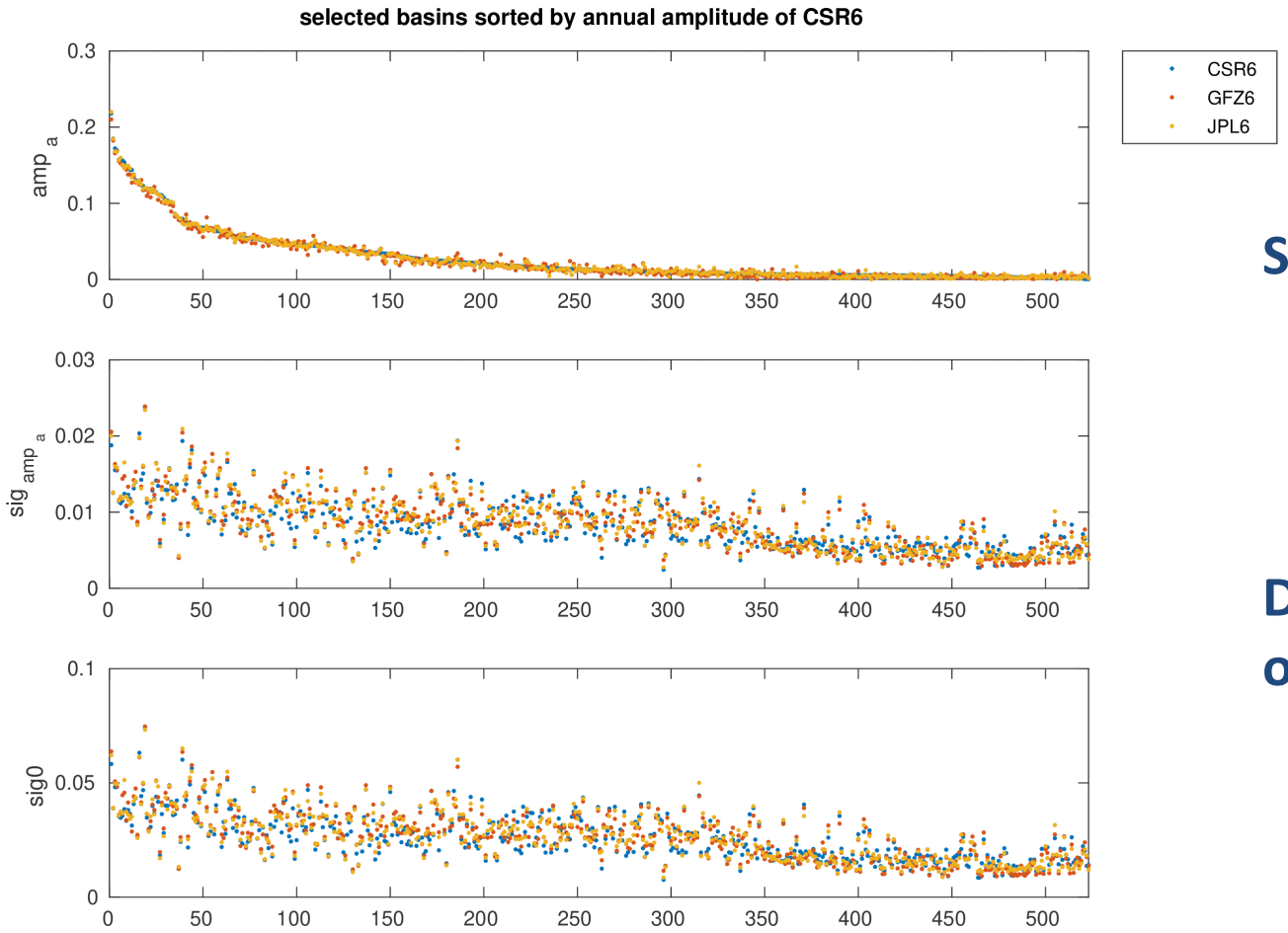


Annual amplitude [EWH] in 500 largest river basins, 300 km Gauss filtered.

Mean error of annual amplitude.

Post fit RMS of residuals.

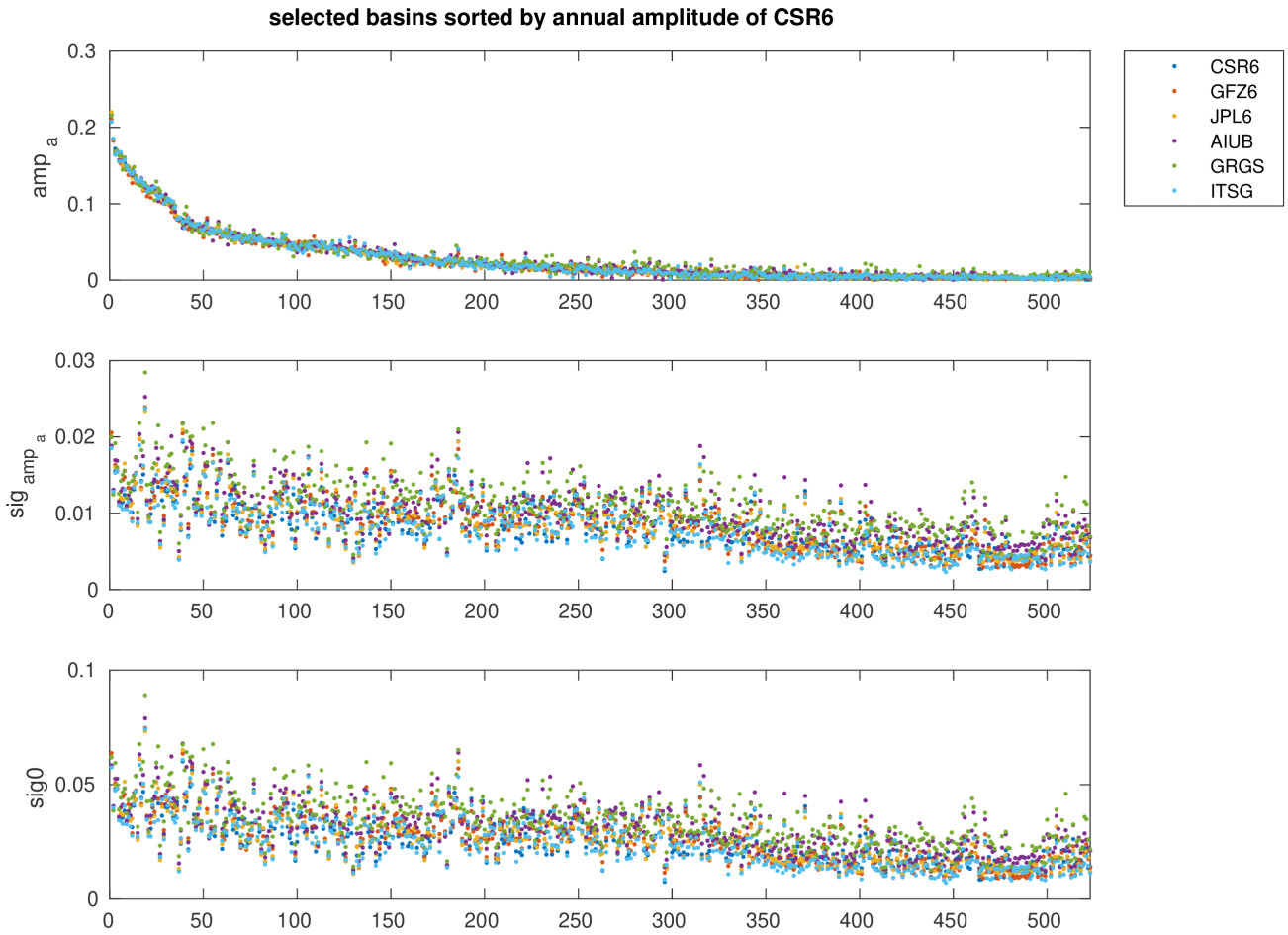
Amplitude of annual variation: RL06



Signal is consistent.

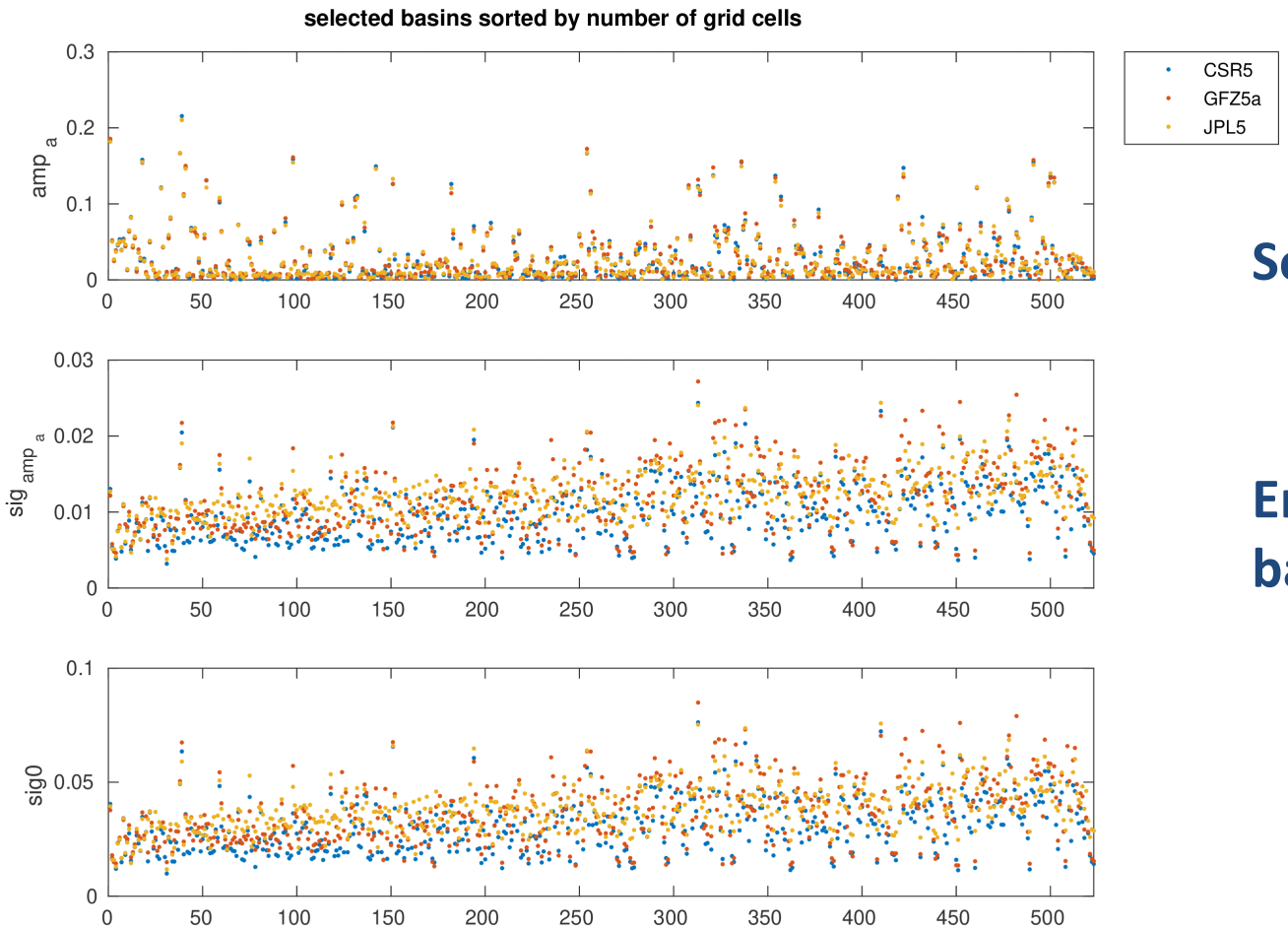
Drastic reduction of noise.

Amplitude of annual variation: RL06 + EGSIEM



Comparable signal content and noise level to EGSIEM time-series (still based on L1B-RL02).

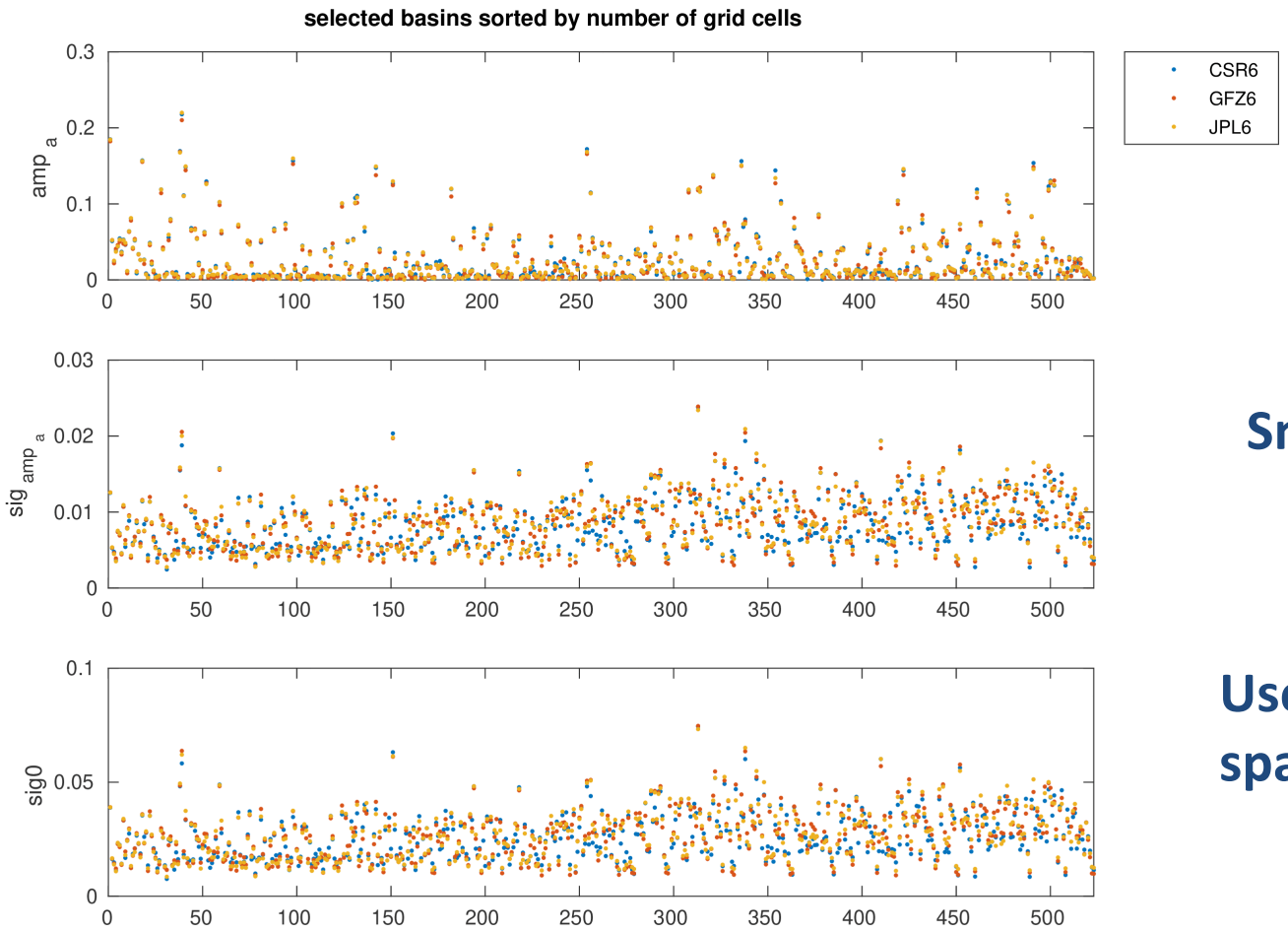
Amplitude of annual variation: RL05



Sorted by basin size.

Errors depend on basin size.

Amplitude of annual variation: RL06

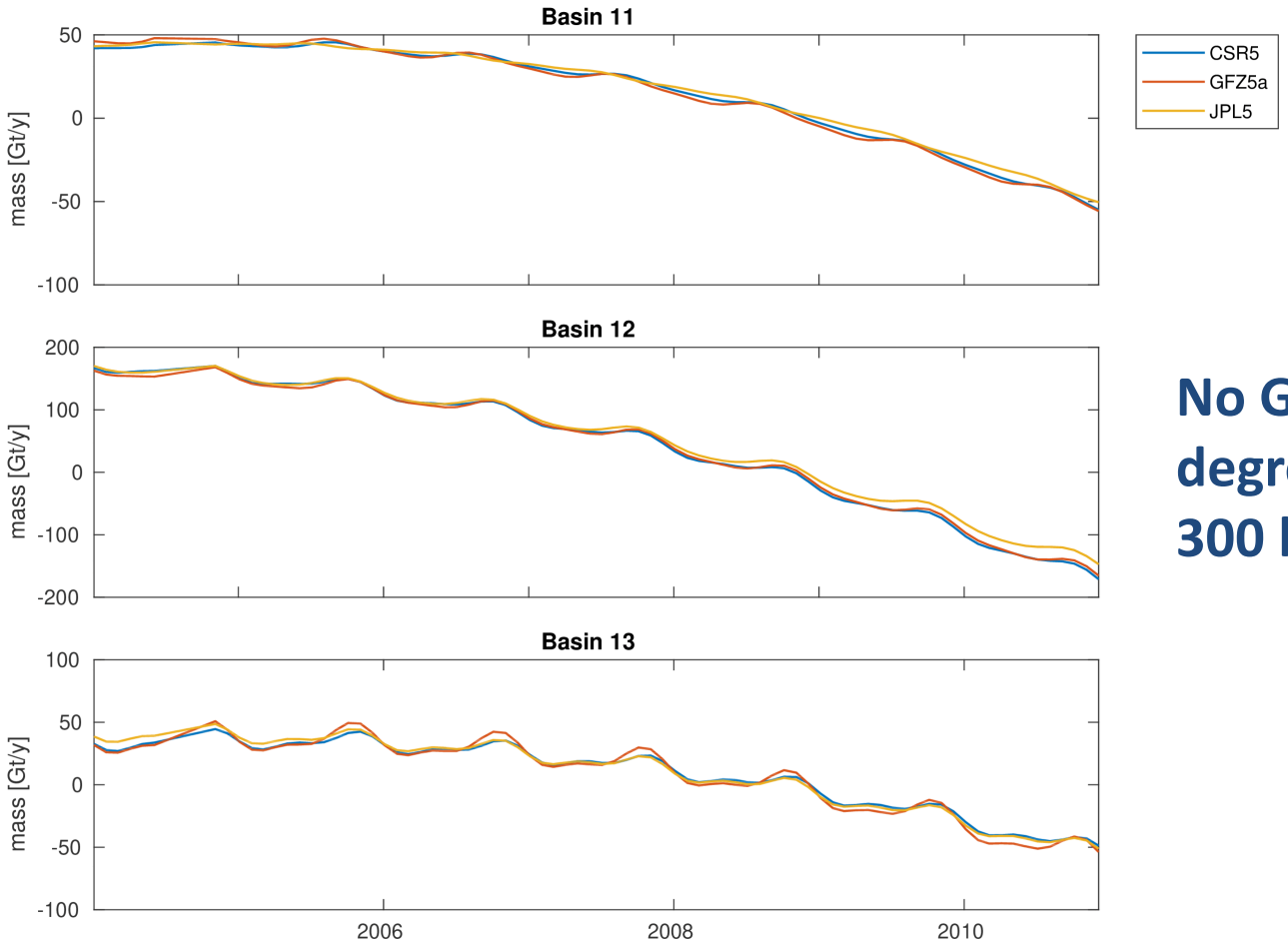


Smaller errors

Useful at smaller spatial scales.

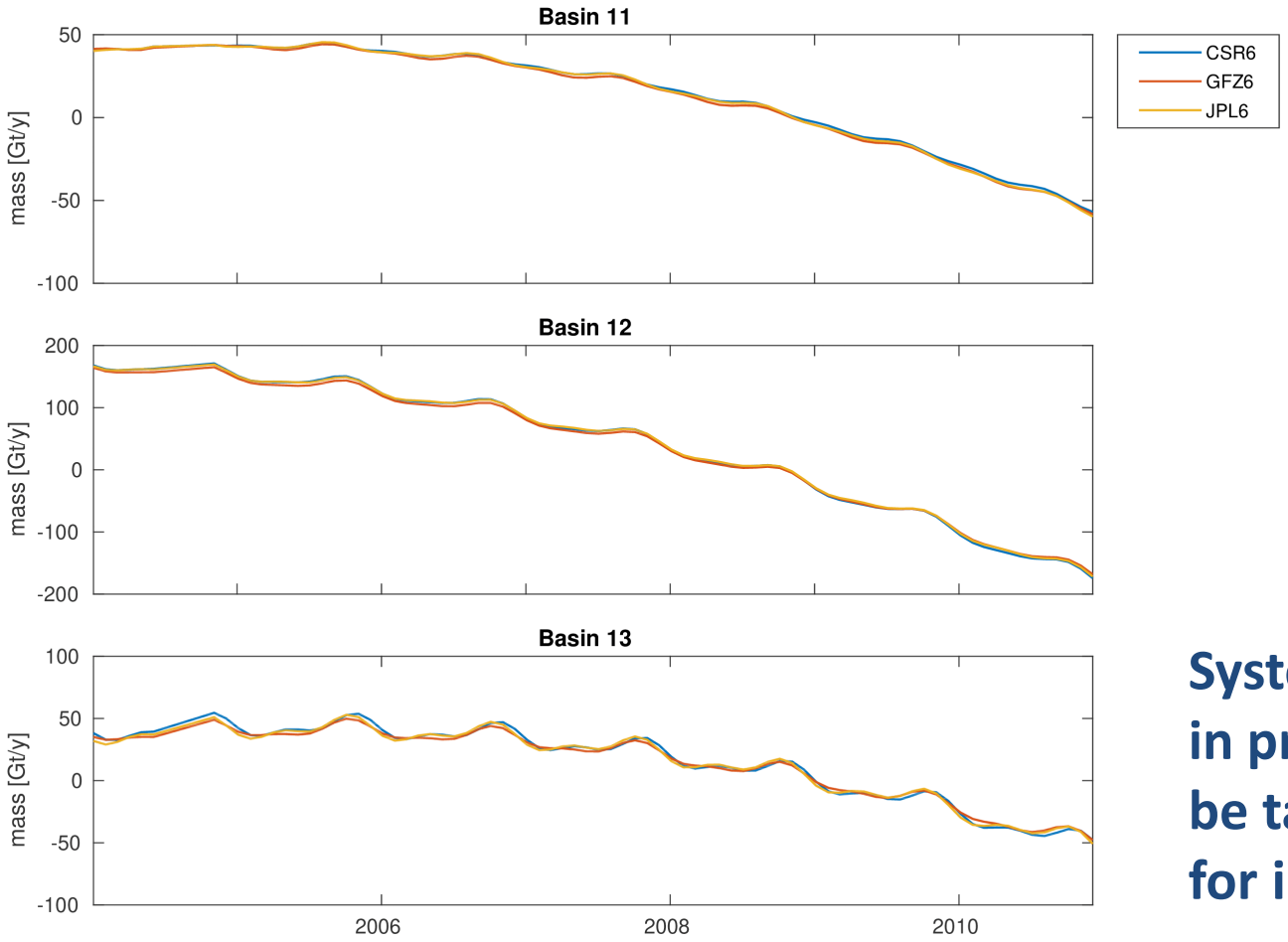
Mass Trends: Antarctica

Mass Trend Western Antarctica: RL05



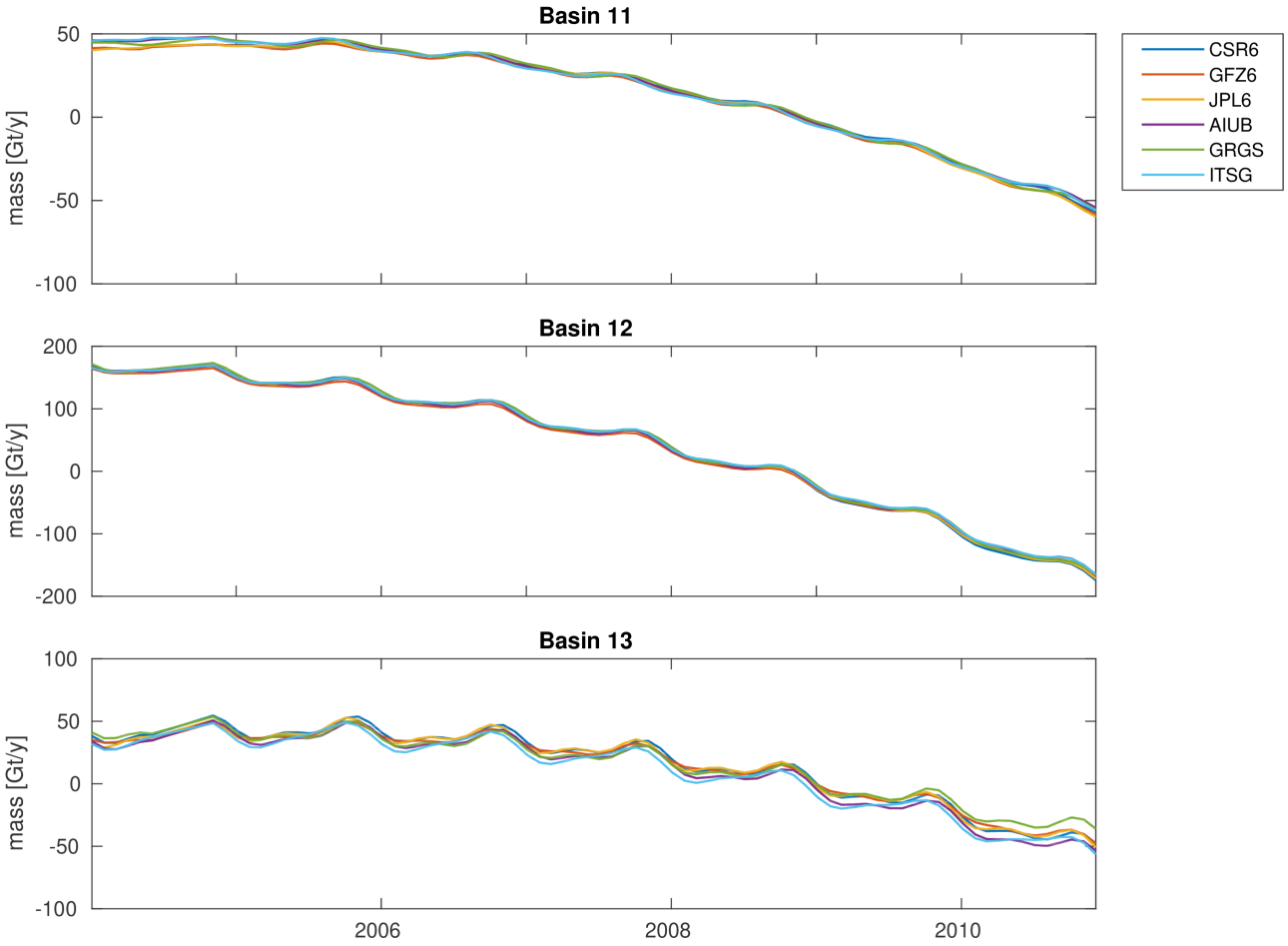
No GAX restored, no degree 1, C_{20} excluded, 300 km Gauss filtered.

Mass Trend Western Antarctica: RL06

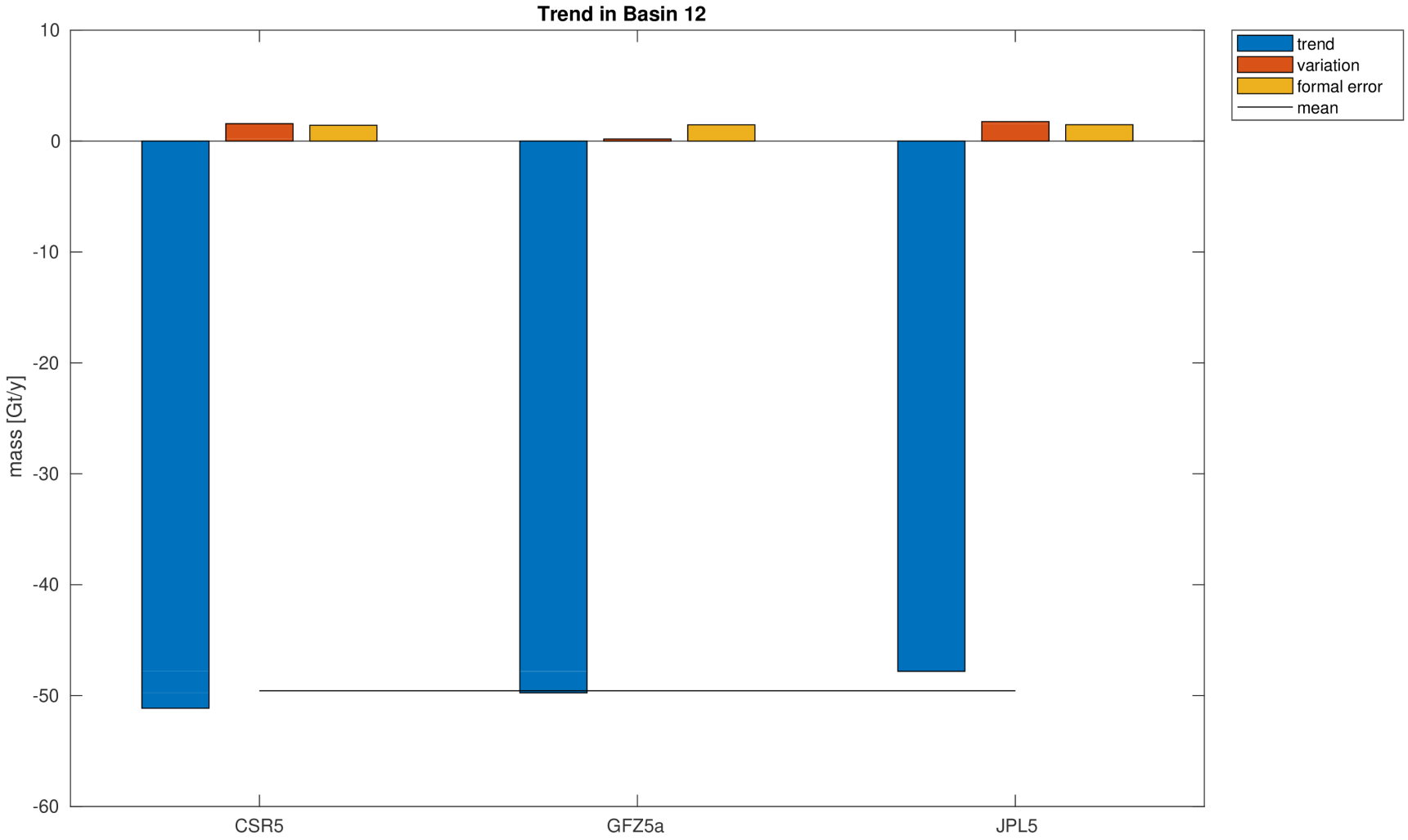


Systematic differences in processing (have to be taken into account for interpretation).

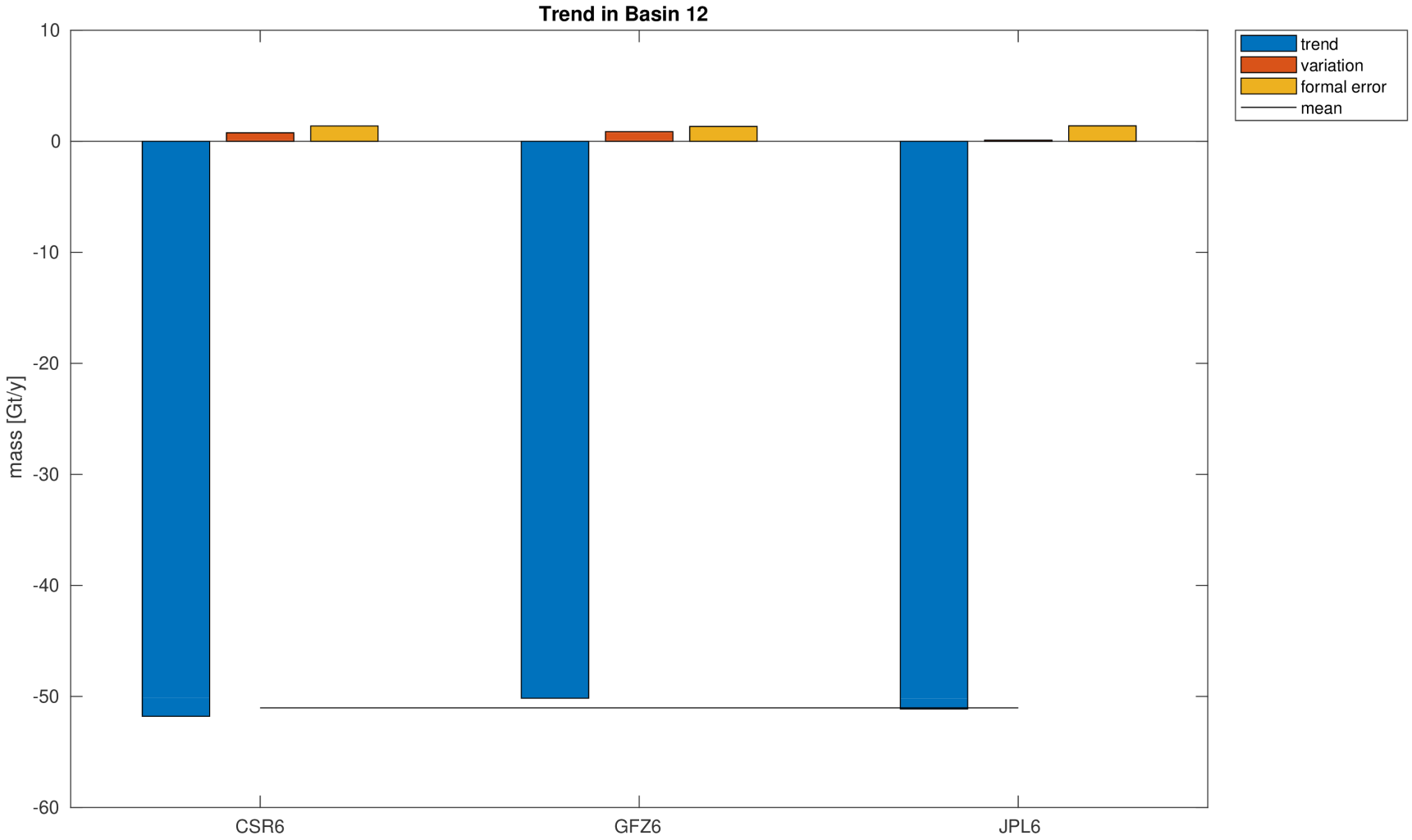
Mass Trend Western Antarctica: RL06 + EGSIEM



Mass Trend Western Antarctica: RL05

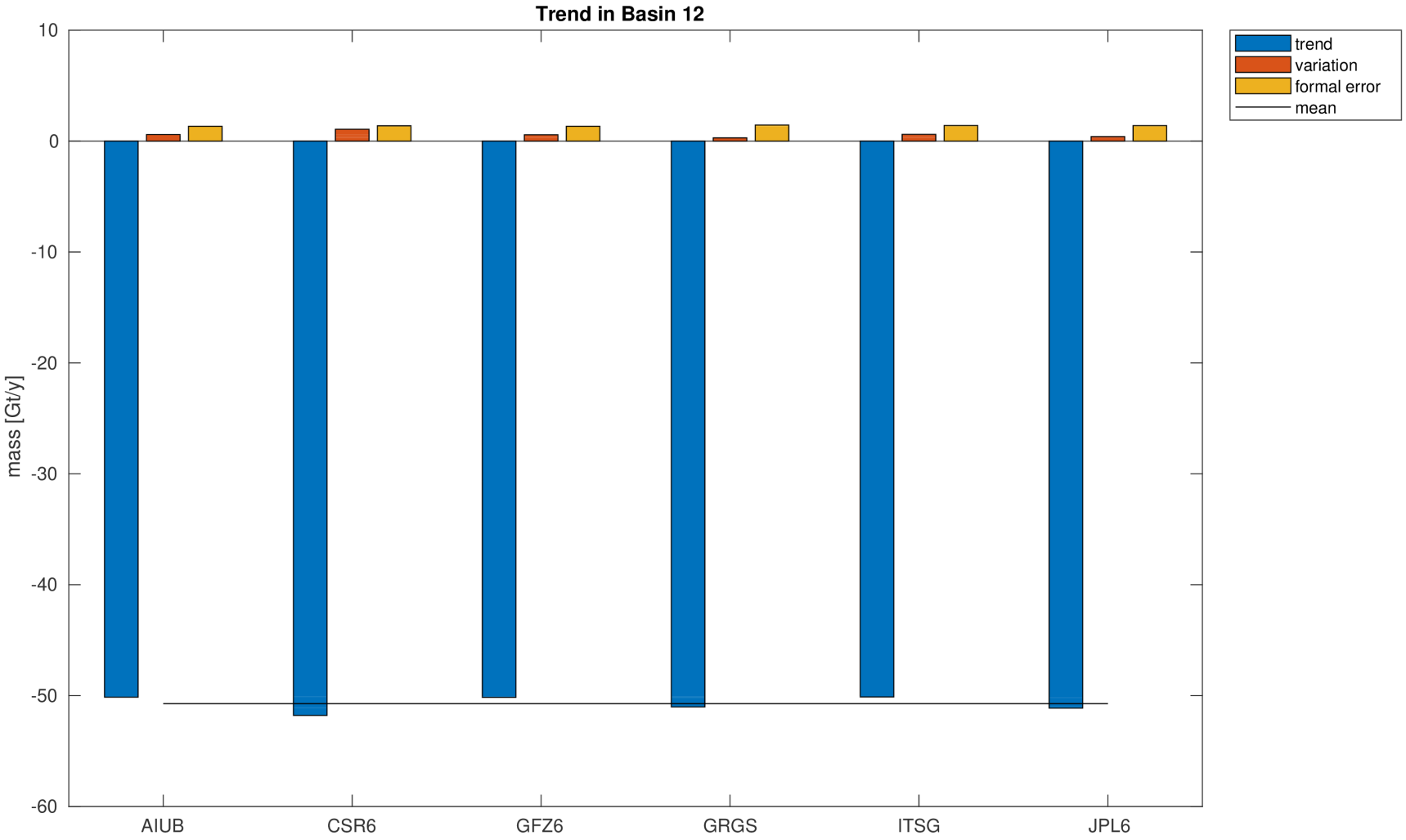


Mass Trend Western Antarctica: RL06



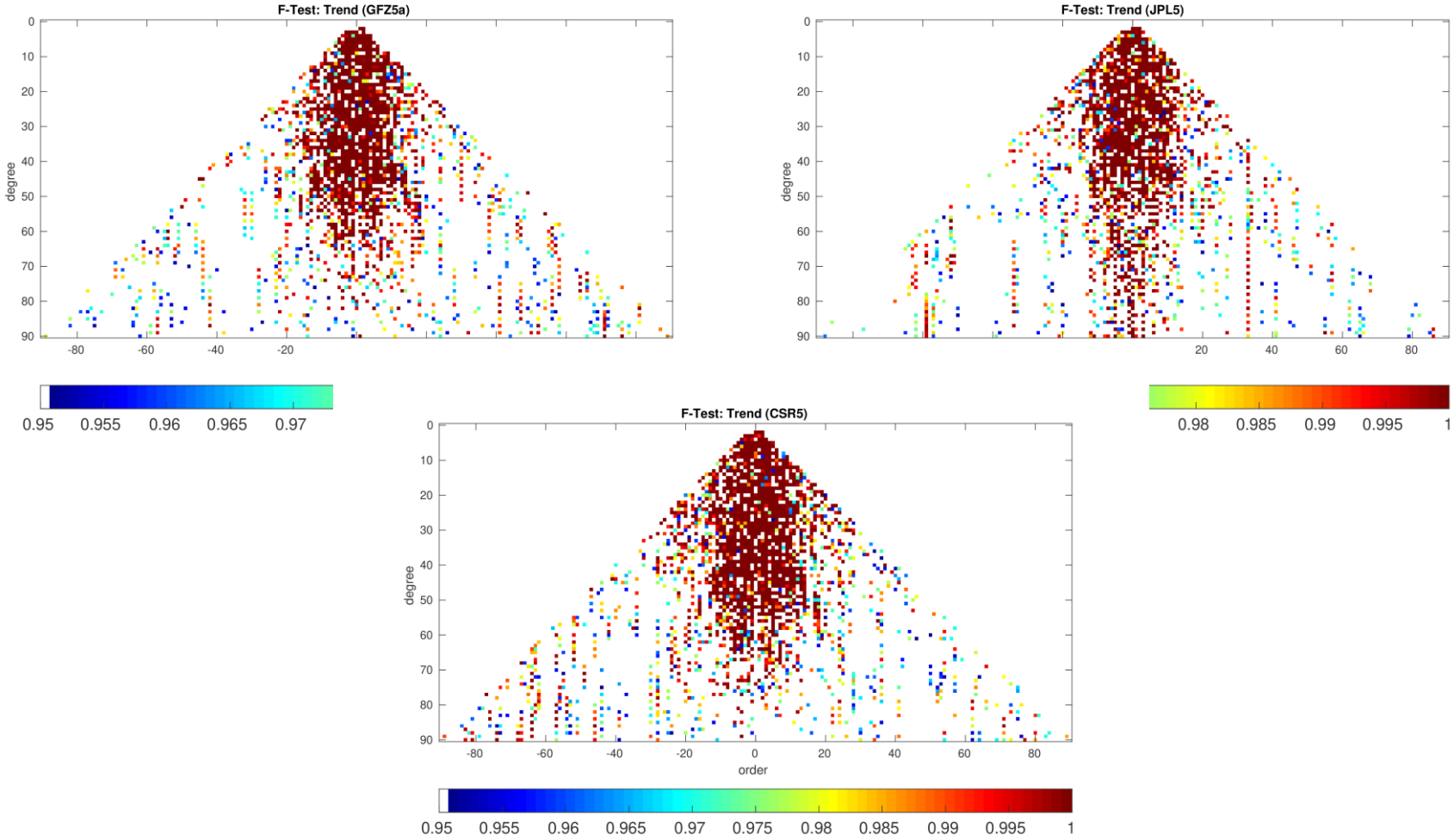
More consistent.

Mass Trend Western Antarctica: RL06 + EGSIEM

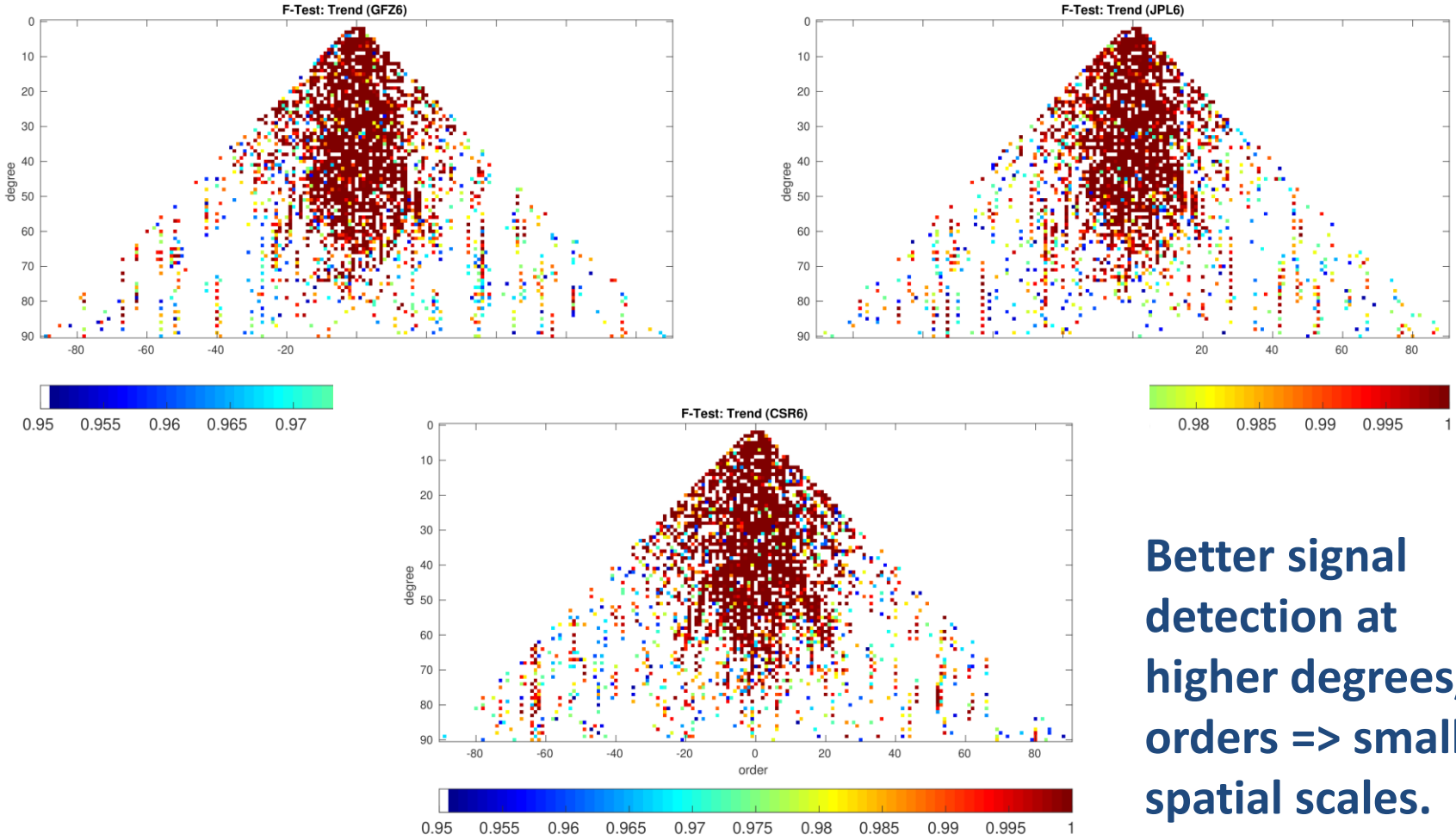


Significance Test: Trends

Significance of trends: RL05

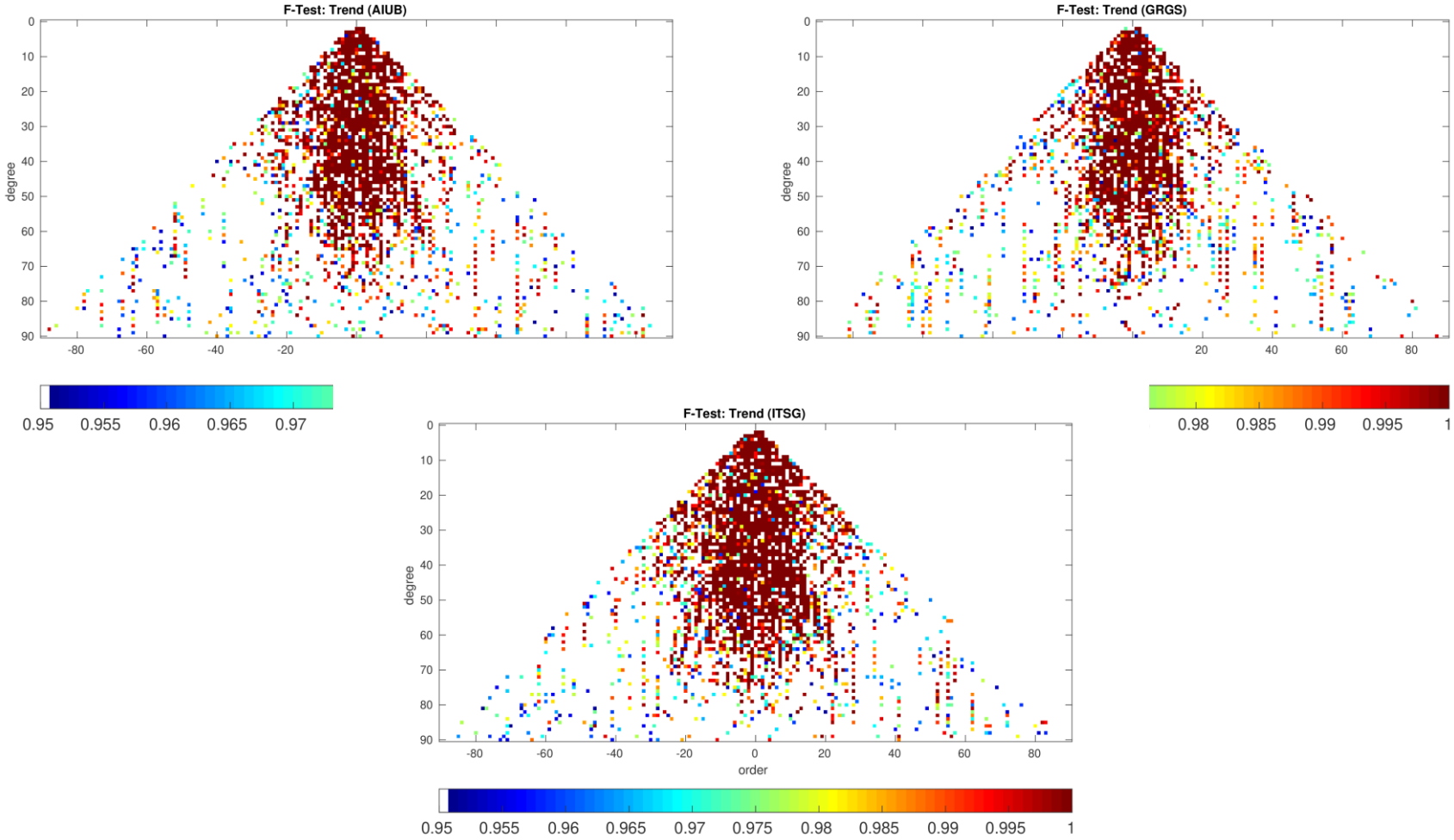


Significance of trends: RL06



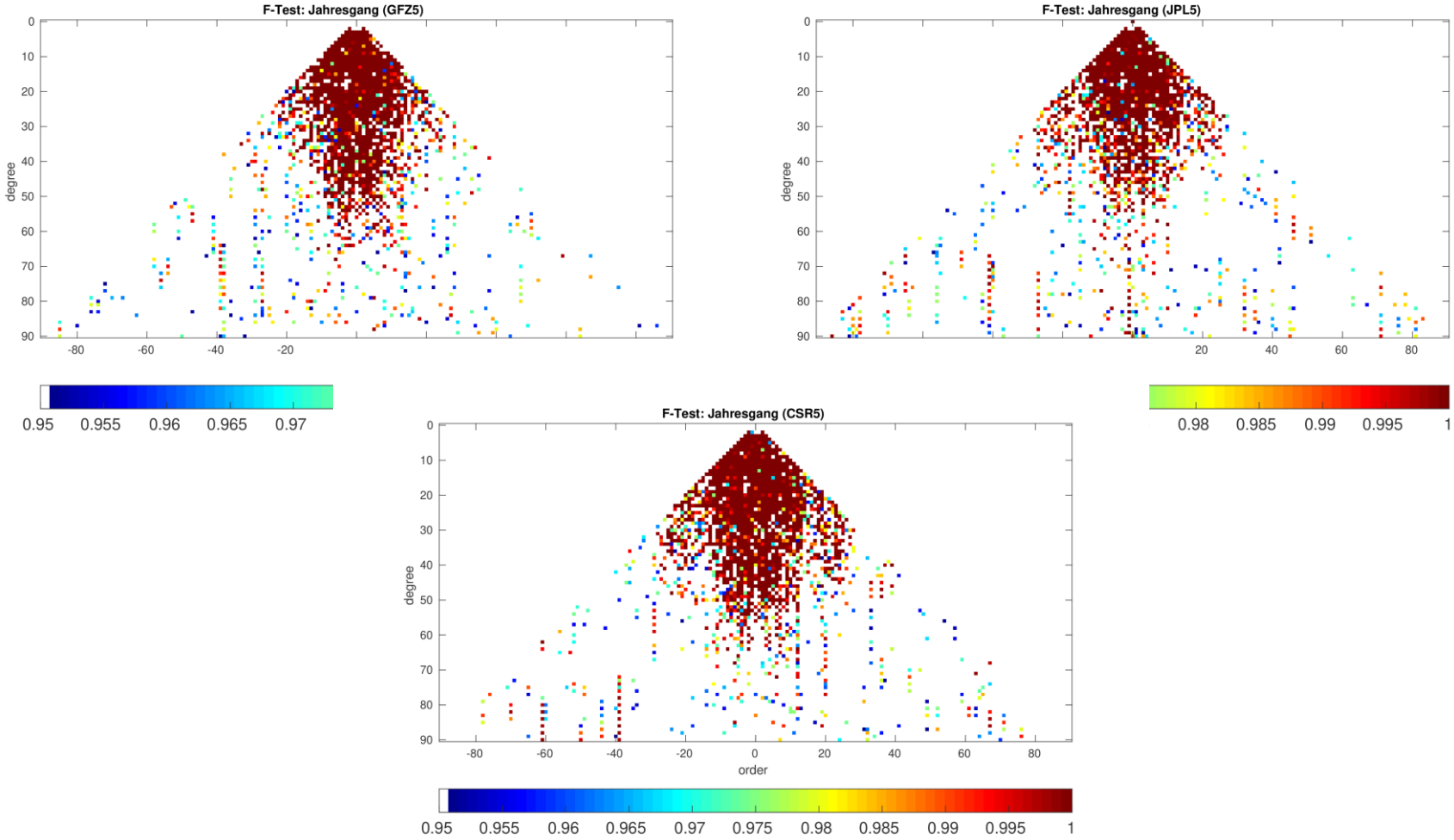
Better signal detection at higher degrees/ orders => smaller spatial scales.

Significance of trends: EGSIEM

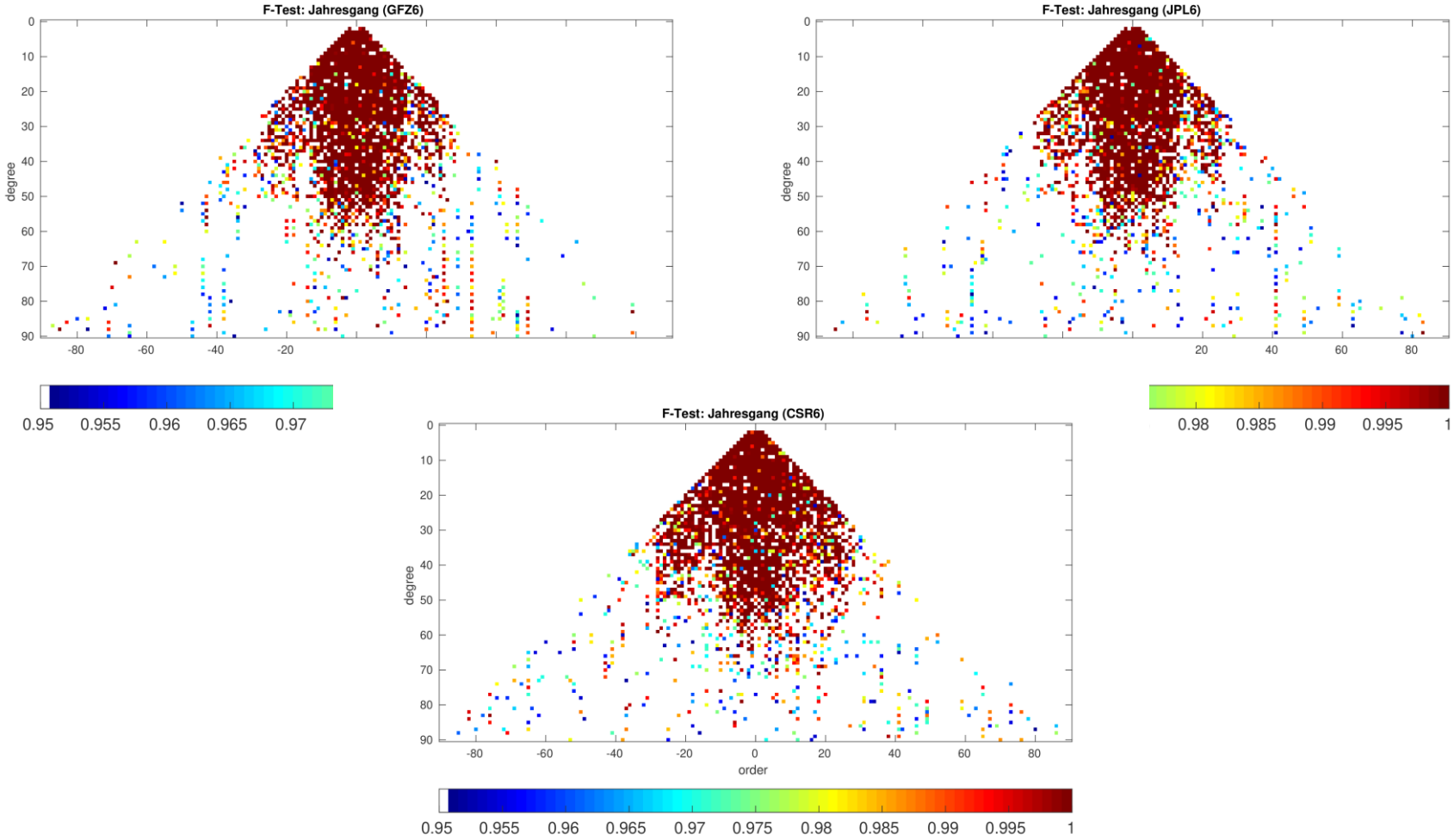


Significance Test: Annual Variation

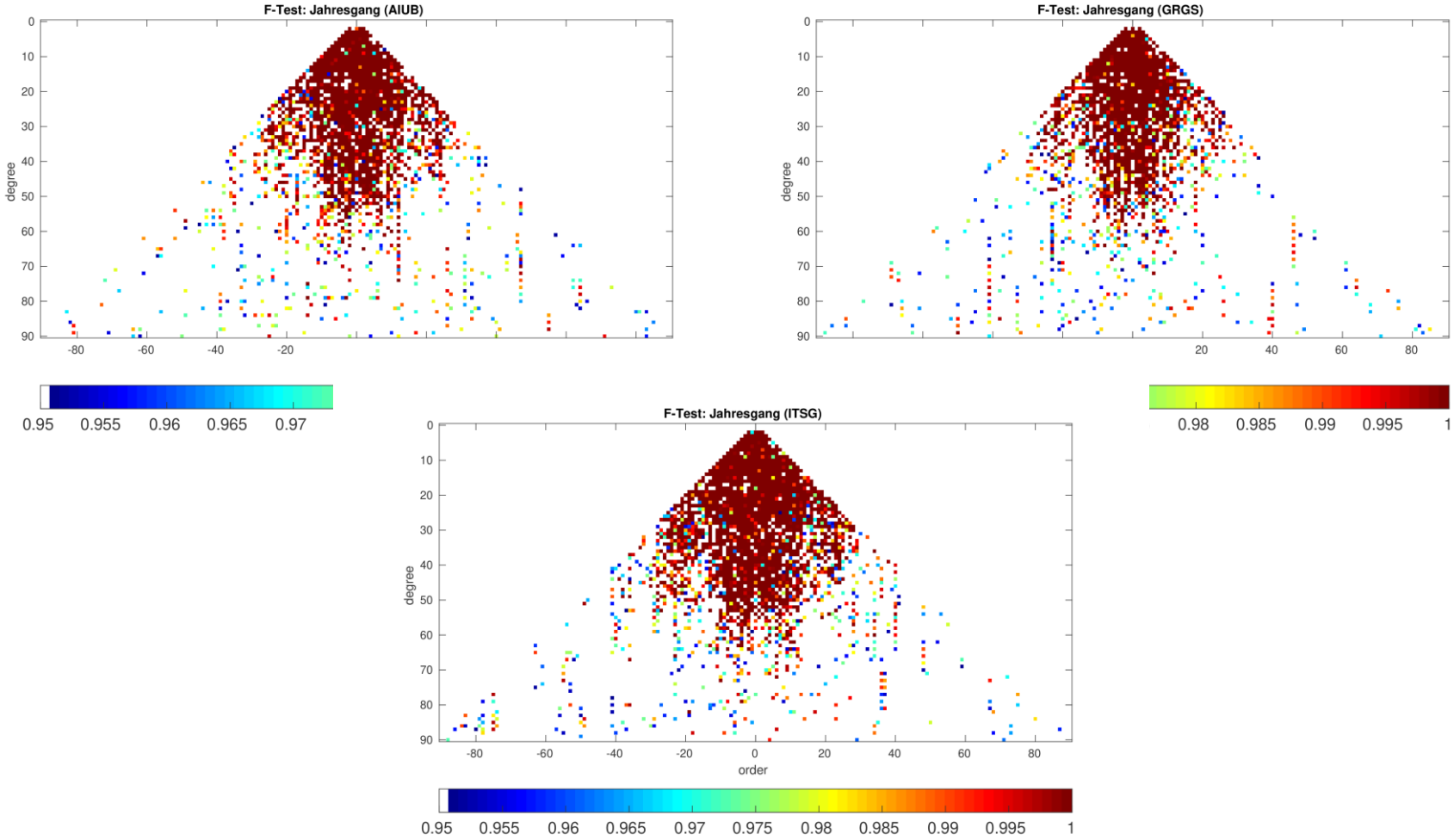
Significance of annual variations: RL05



Significance of annual variations: RL06

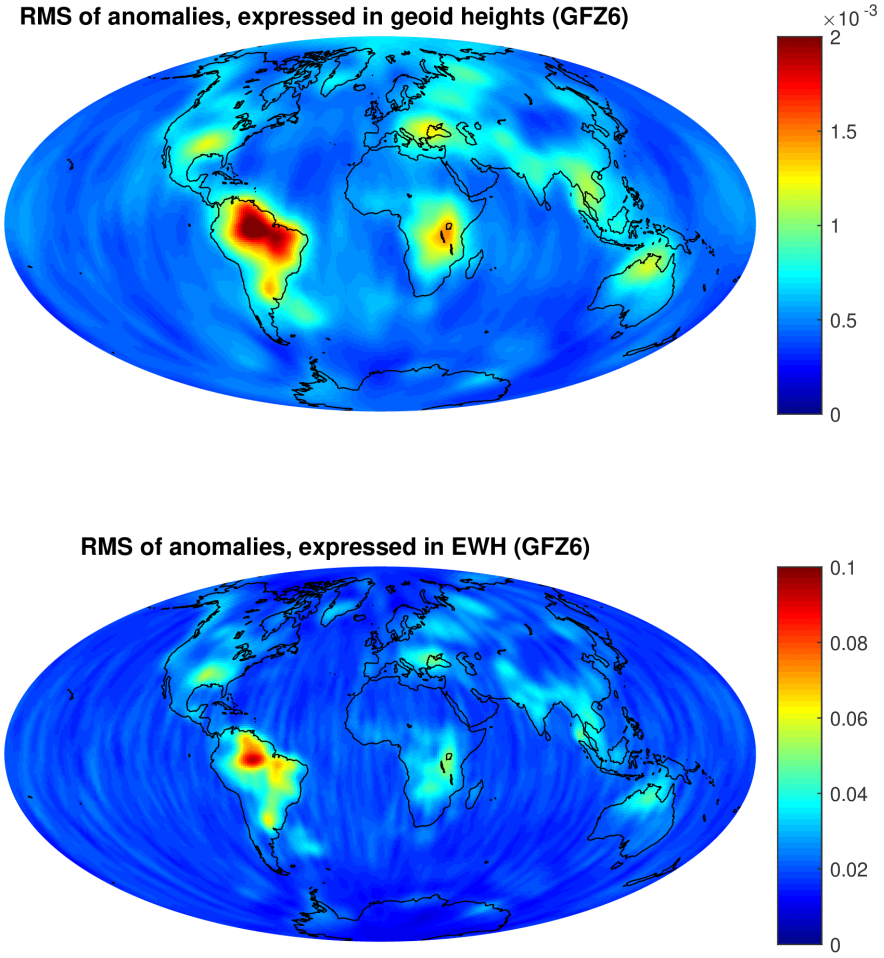


Significance of annual variations: EGSIEM



Variability over oceans

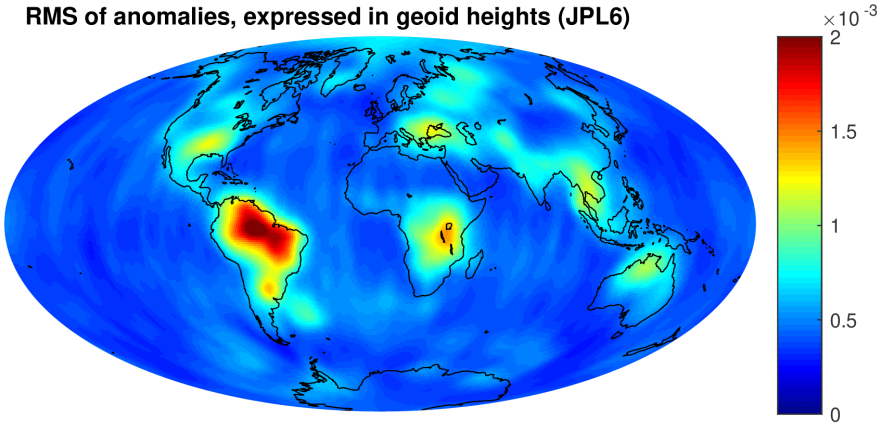
Variability relative to mean signal model: GFZ-RL06



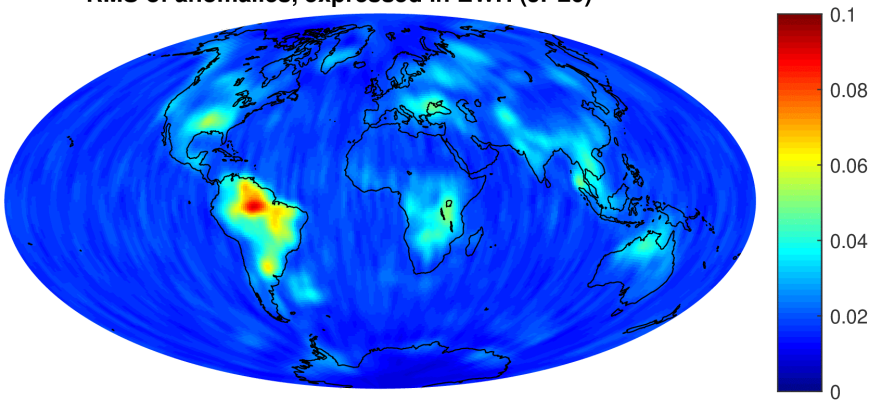
1. Monthly means of 6 time series.
2. Fit of deterministic signal model .
3. Residuals of individual monthly fields with respect to mean signal model.
4. 400 km Gauss filter.
5. RMS per grid cell 2004-2010.

Variability relative to mean signal model: JPL-RL06

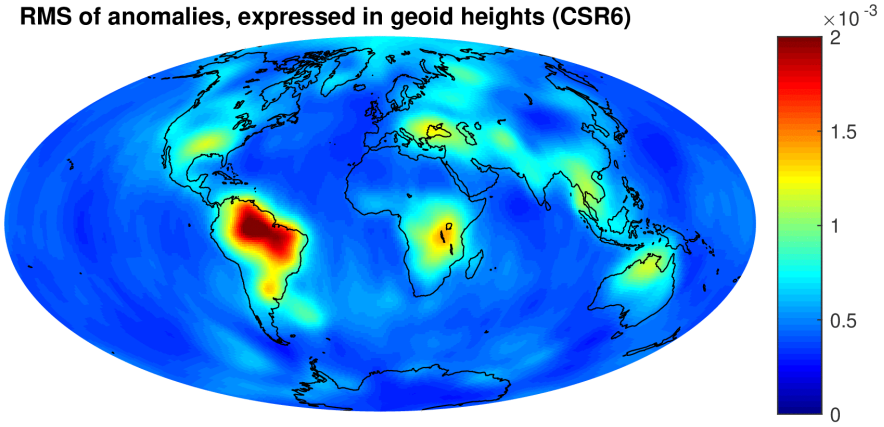
RMS of anomalies, expressed in geoid heights (JPL6)

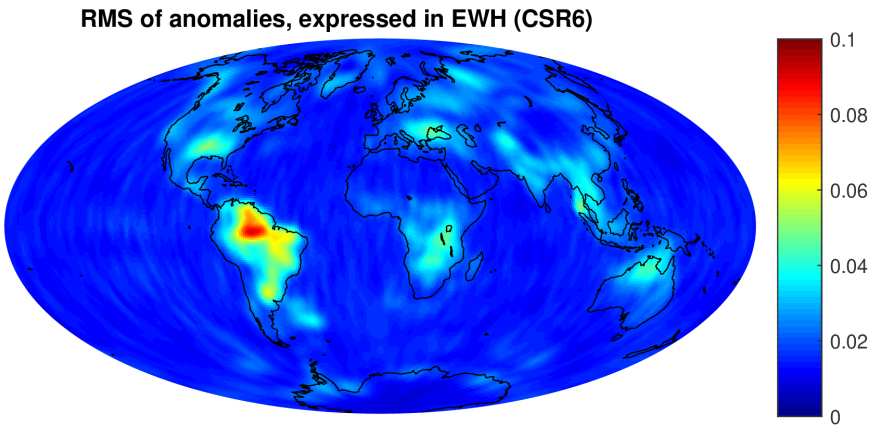


RMS of anomalies, expressed in EWH (JPL6)

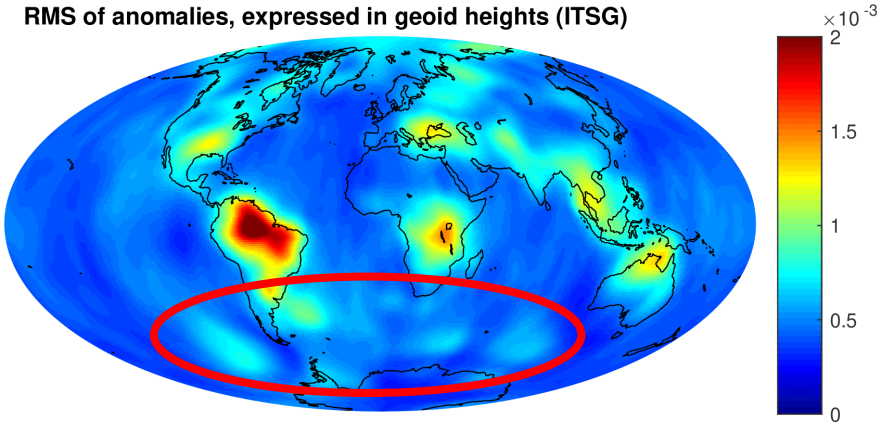


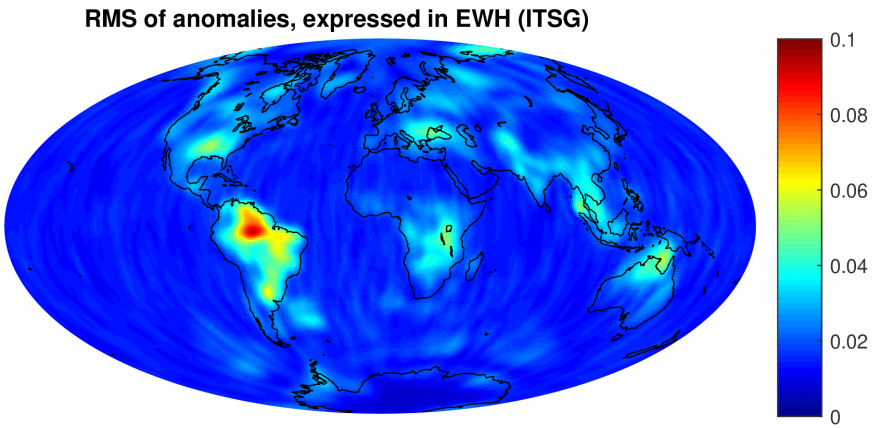
Variability relative to mean signal model: CSR-RL06





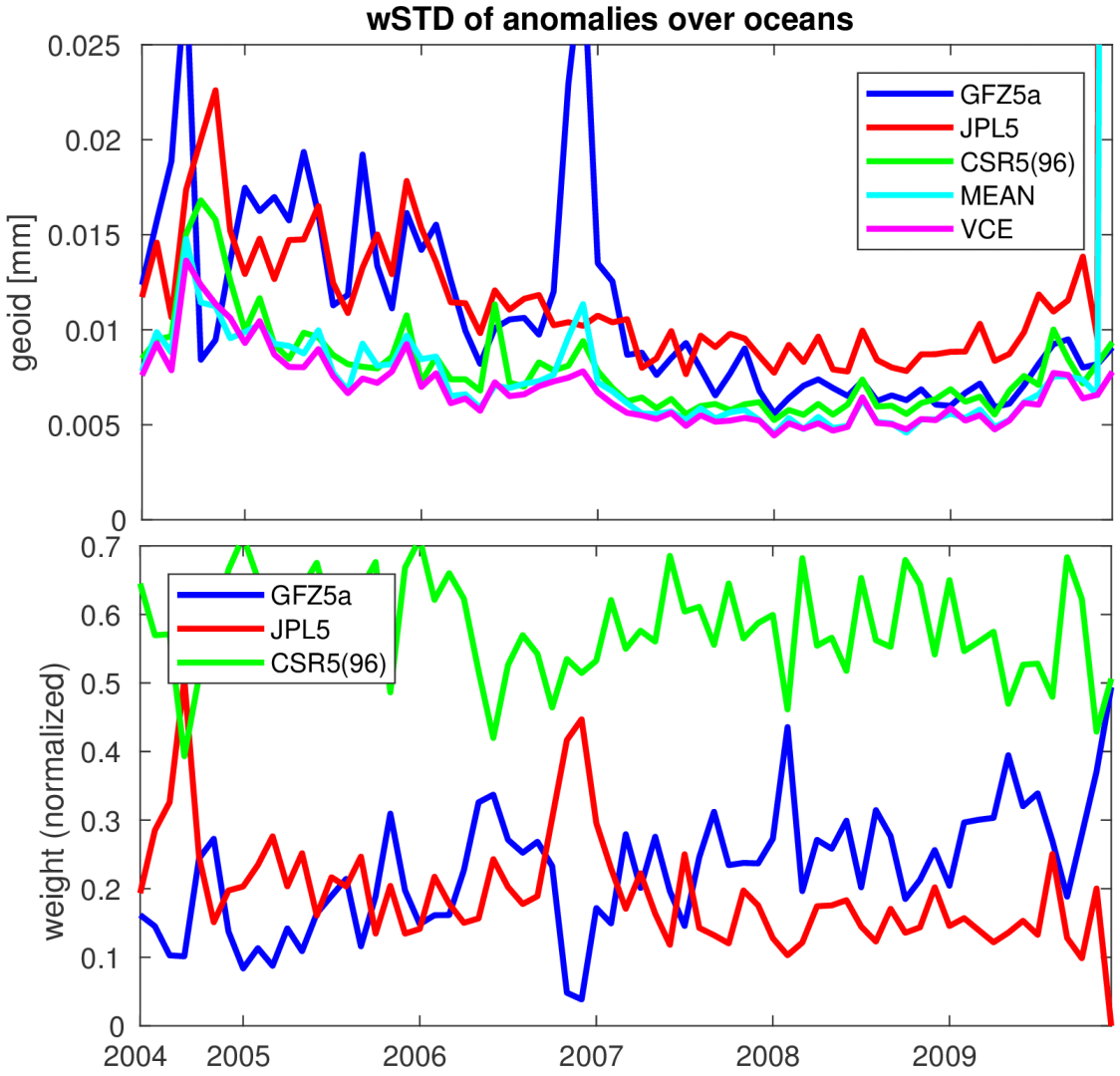
Variability relative to mean signal model: ITSG





Different background models (ocean tides, AOD).

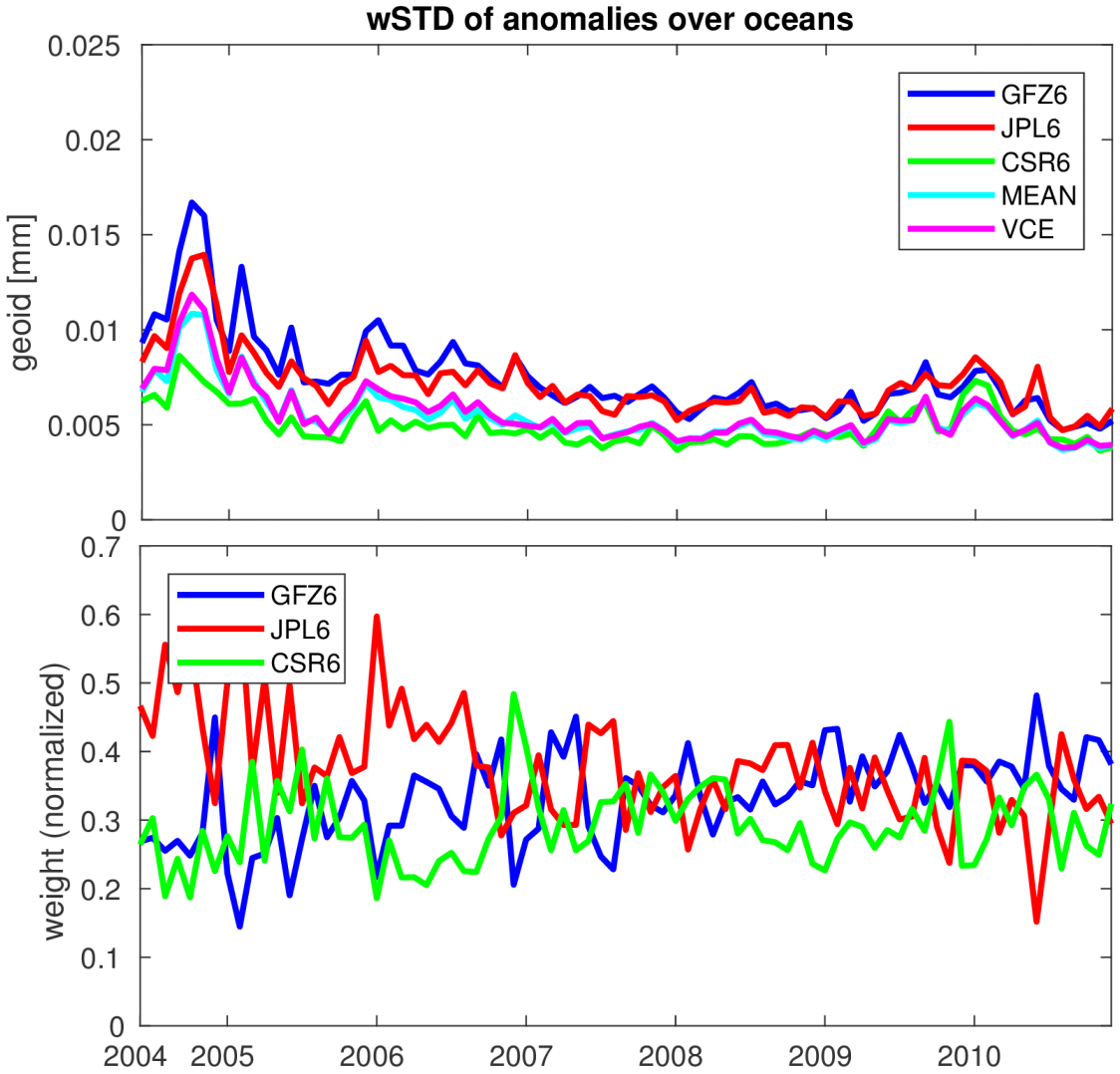
Monthly noise evaluation: RL05



Relative noise levels derived from variability over oceans.

Relative weights determined by variance component estimation (comparison to mean).

Monthly noise evaluation: RL06

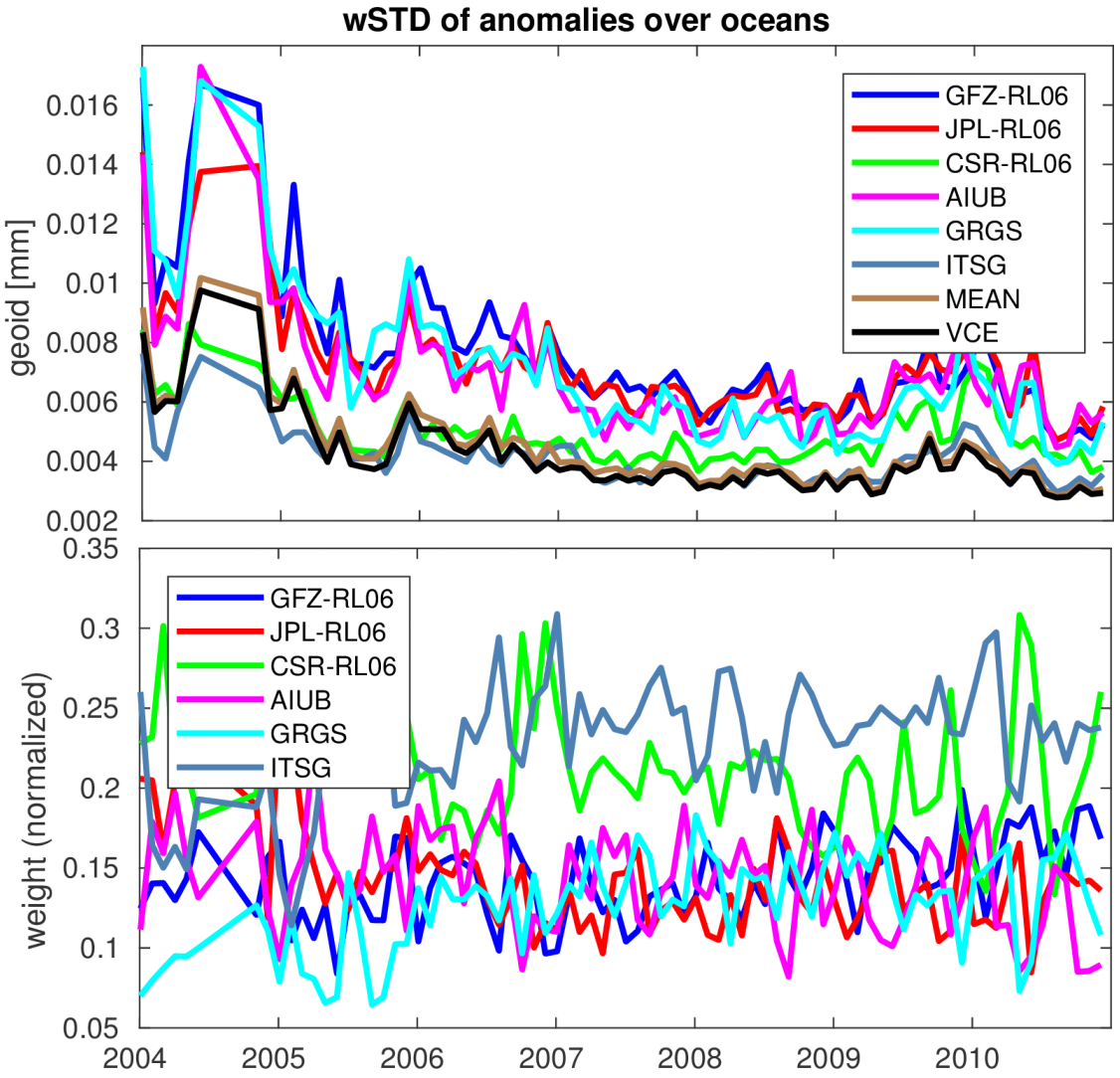


Drastic reduction in noise, much more homogeneous noise levels then RL05.

Low weights of CSR-RL06 do not correspond to low noise level.

Systematic differences to JPL and GFZ!

Monthly noise evaluation: RL06 + EGSIEM



High weights for CSR-RL06.

Consistency with EGSIEM (comparable to RL05 standards).

Summary and Outlook

- COST-G quality control is effective.
- Terms of Reference, Standards document and SINEX format description are available.
- Waiting for SINEX-NEQs for combination on the NEQ level.
- Future GRACE-FO operational combination.