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COST-G

Combination Service for Time-variable Gravity Fields

COST-G combination of Swarm gravity fields of different analysis centers

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Swarm Data Quality Workshop

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UNIVERSITÄT BERN

asu Astronomický ústav AV ČR

TU Delft

The Ohio State University School of Earth Sciences www.earthsciences.osu.edu

TU Graz Graz University of Technology

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International Association of Geodesy

Int. Gravity Field Service

International Association of Geodesy
IGFS

IAG

ERS

Int. Earth Rotation Service

BGI

Int. Gravimetric Bureau

ISG

Int. Geoid Service

PSMSL

Permanent Service for Mean Sea Level

International DORIS Service
IDS

IGETS

Int. Gedoynamics and Earth Tide Service

Bureau International des Poids et Mesures

IGS INTERNATIONAL GNSS SERVICE

ICGEM

Int. Center for Global Earth Models

ILRS

Int. Laser Ranging Service

iDEMS

Int. DEM Service

COST-G

Combination Service for Time-variable Gravity Fields

Product Center of the IGFS

IVS

Int. VLBI Service

COST-G: Products

COST-G
Combination Service for Time-variable Gravity Fields

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Products

COST-G provides a number of products via different platforms and channels:

GRACE

Level 2 – Products are sets of spherical harmonic coefficients which stem from the combination on solution or normal equation level. The coefficients need to be processed by a spherical harmonic synthesis in order to derive gridded data. They are available at the International Center for Global Gravity Earth Models (ICGEM): http://icgem.gfz-potsdam.de/series/03_COST-G/GRACE

Level 2b – Products will be available soon.

Level 3 – Products will be available soon.

GRACE Follow-On

Level 2 – Products will be available soon.

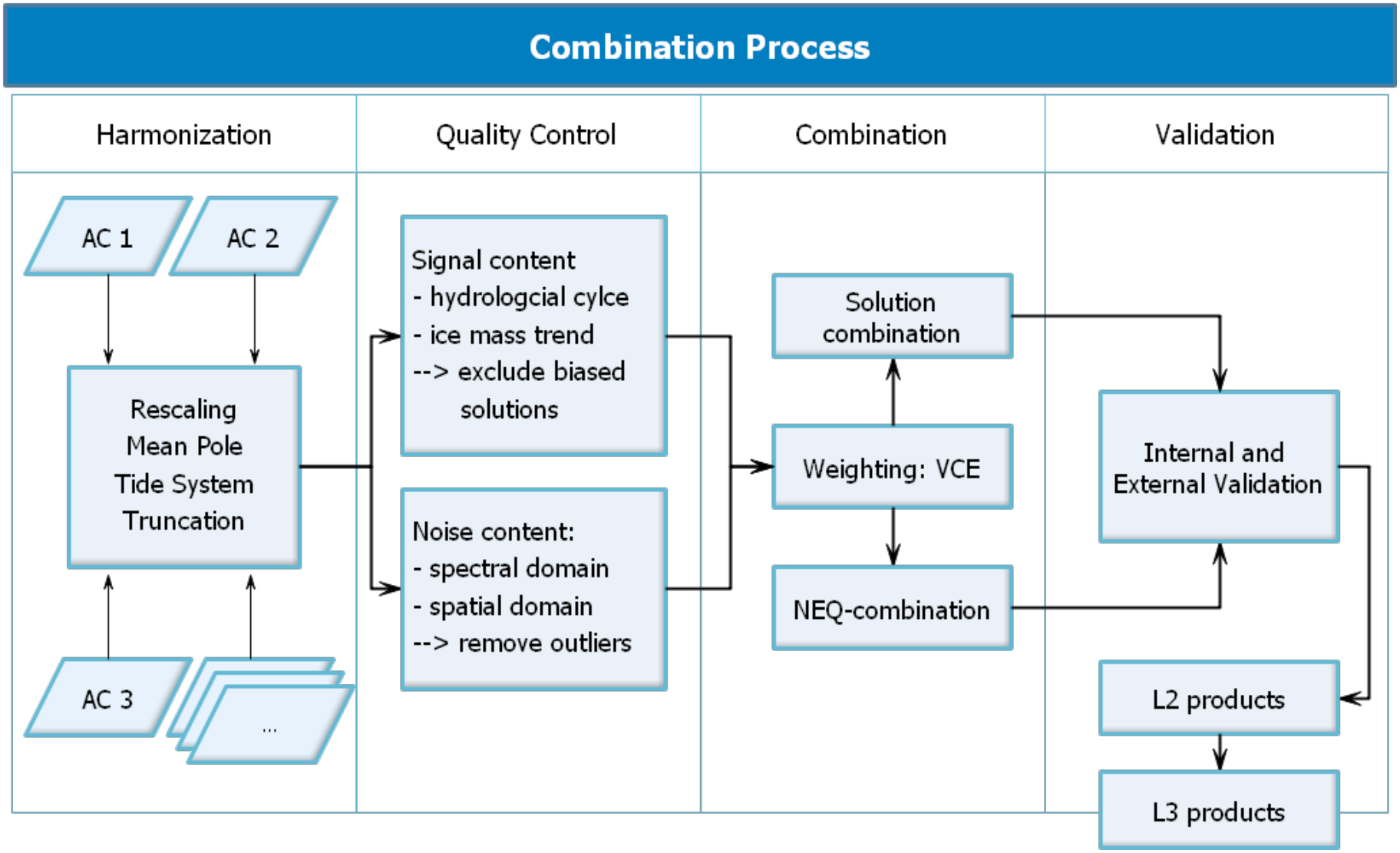
Level 2b – Products will be available soon.

Level 3 – Products will be available soon.

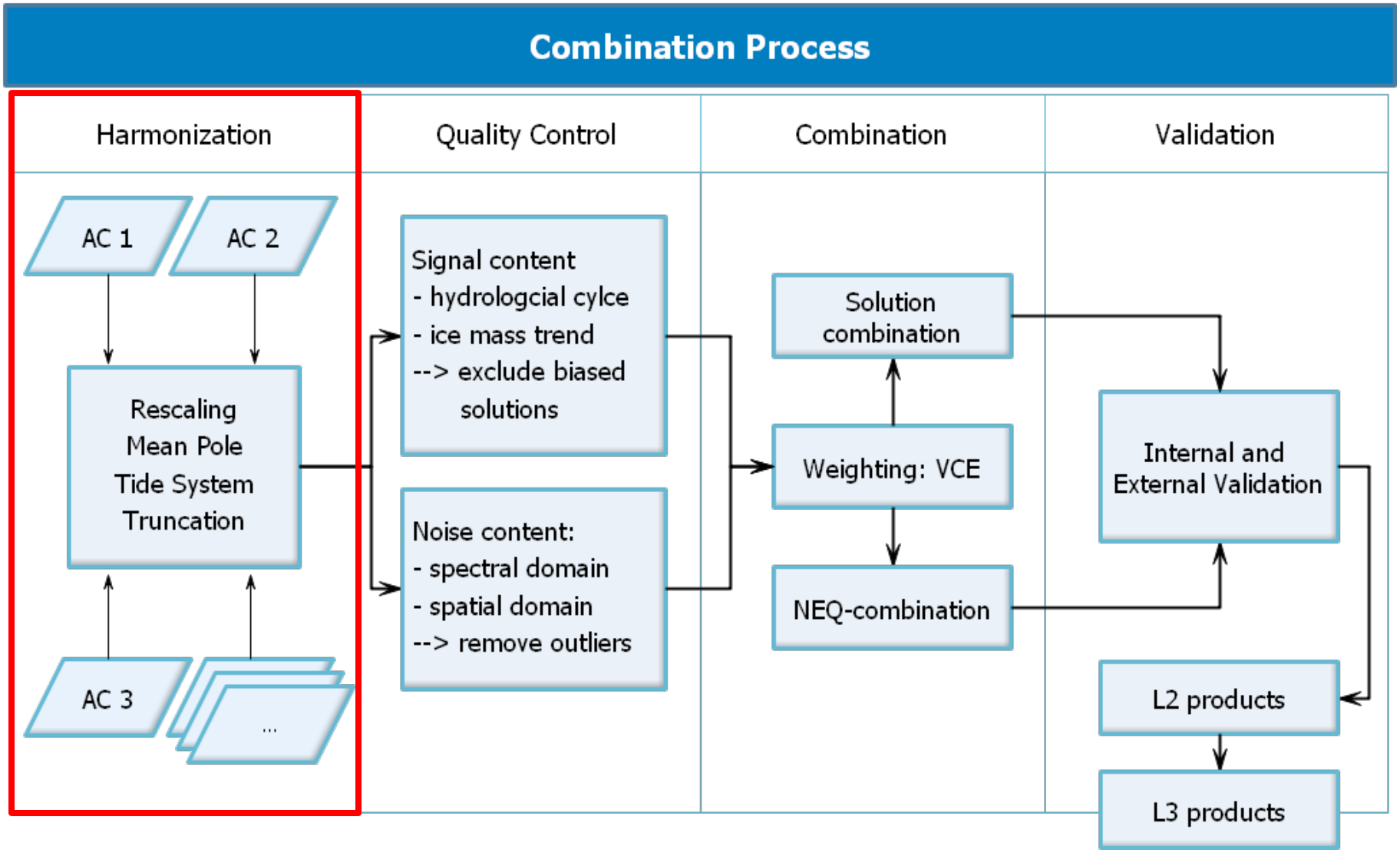
Swarm

Level 2 – products are a combination of different kinematic orbit products and various gravity field recovery approaches. Data is available at the International Center for Global Gravity Earth Model (ICGEM): http://icgem.gfz-potsdam.de/series/03_COST-G/Swarm

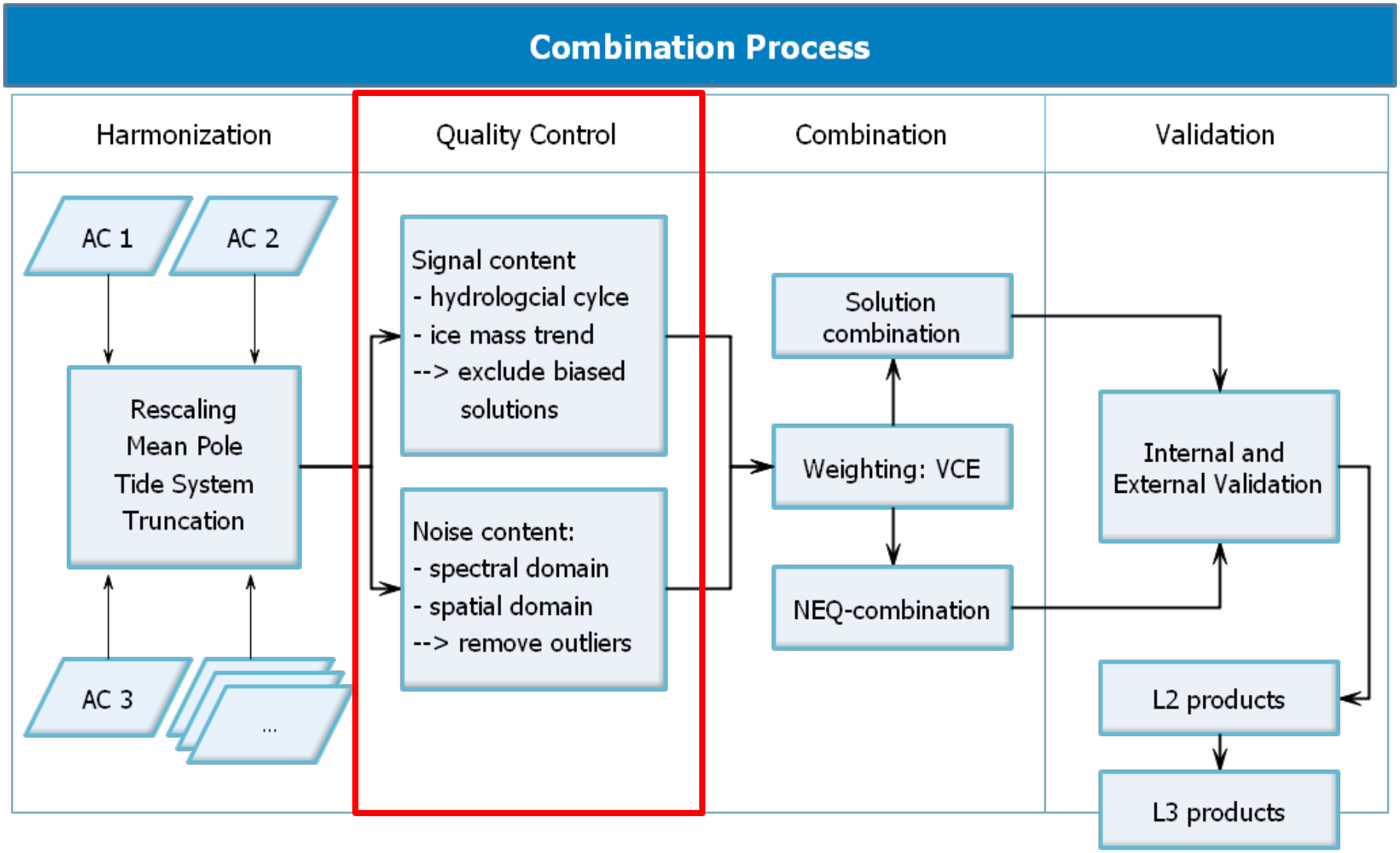
COST-G: Workflow



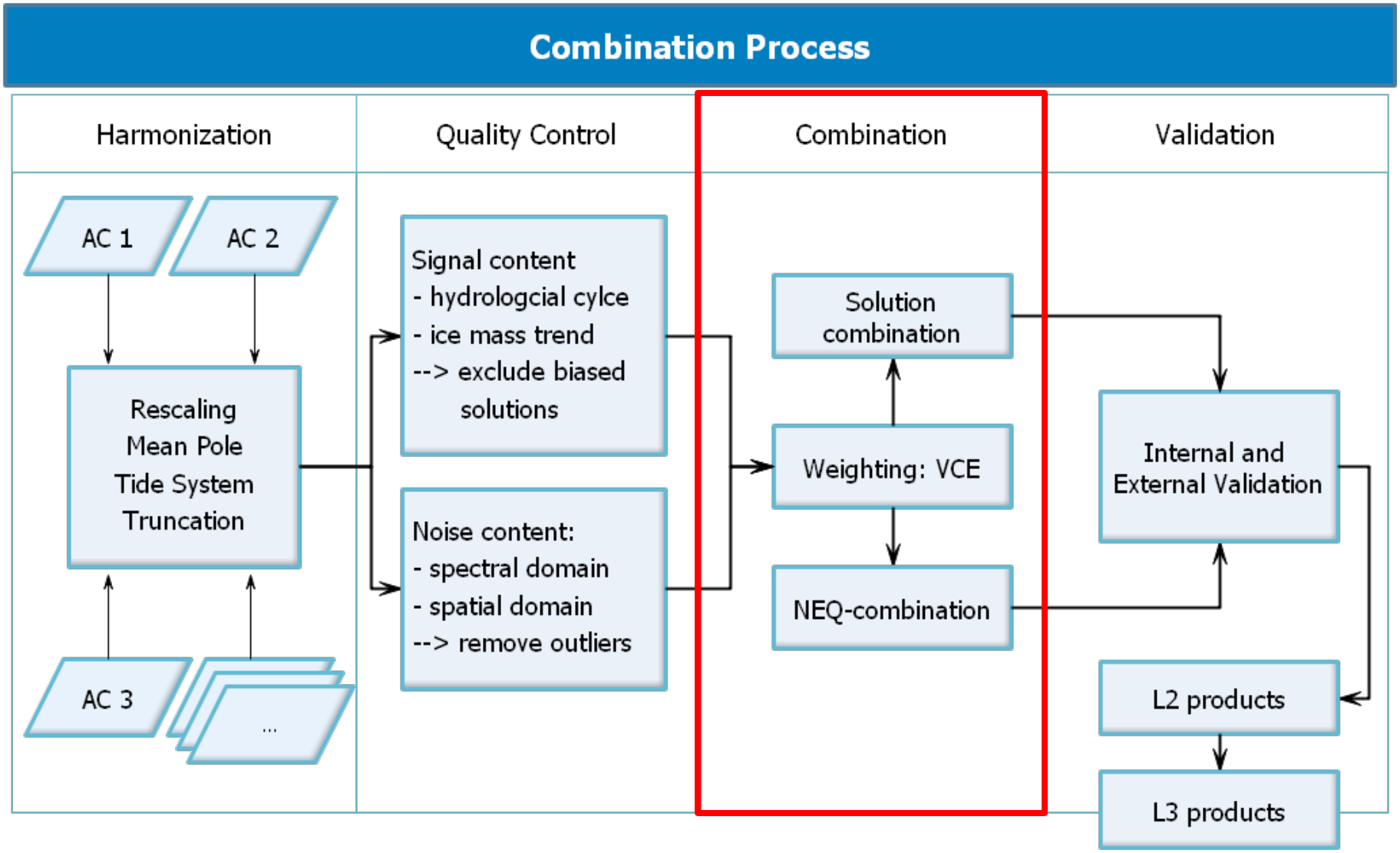
COST-G: Harmonization



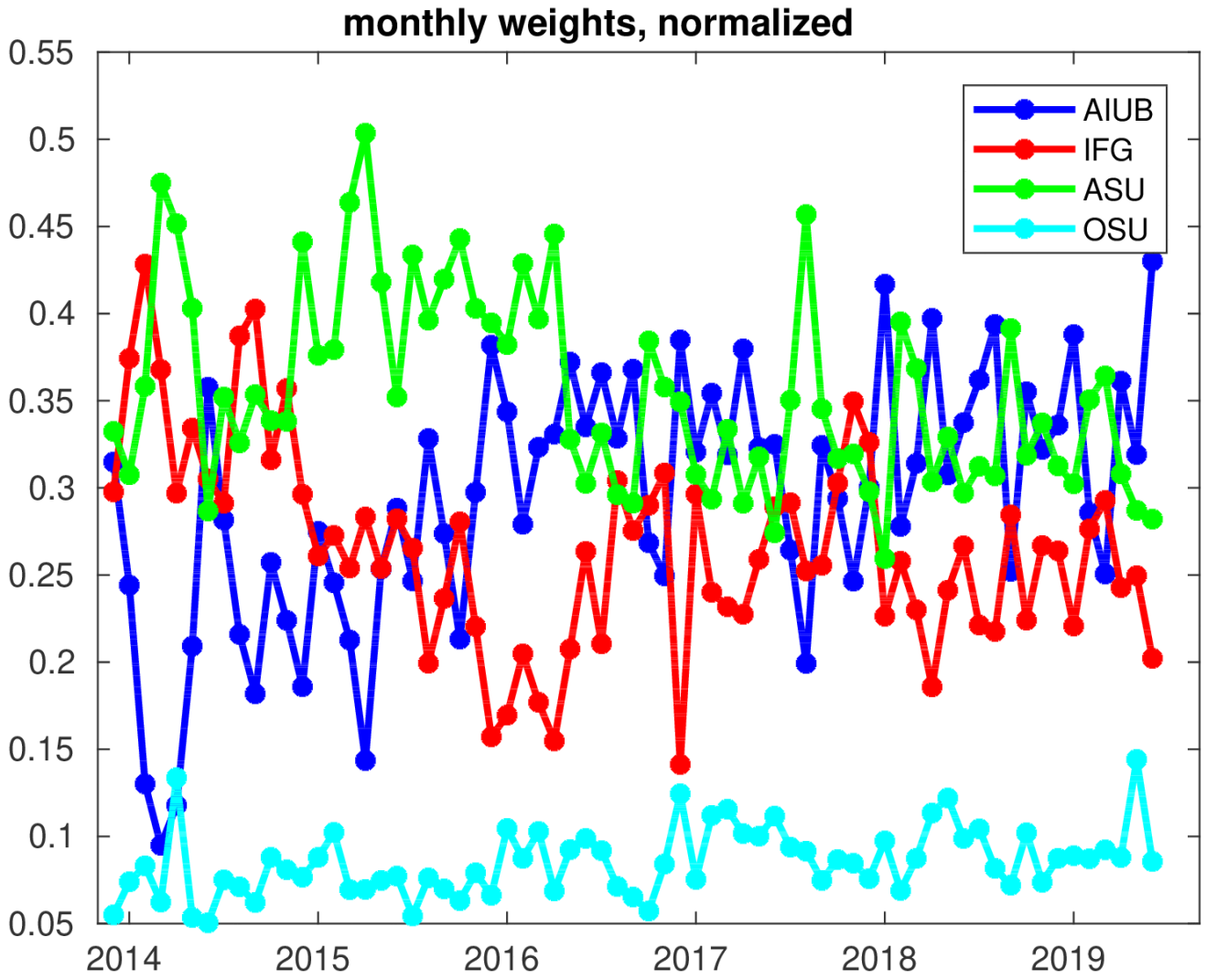
COST-G: Quality Control



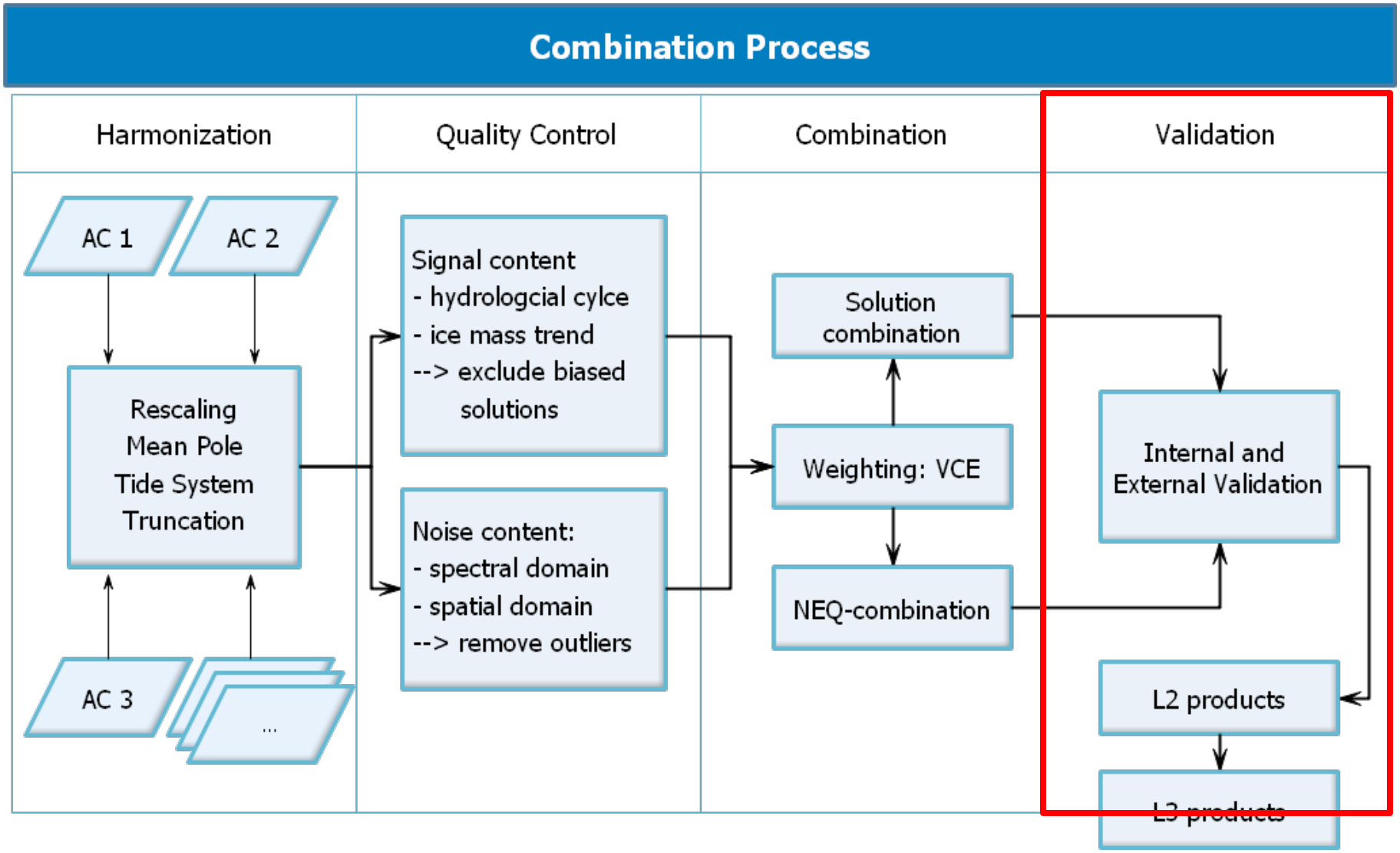
COST-G: Combination



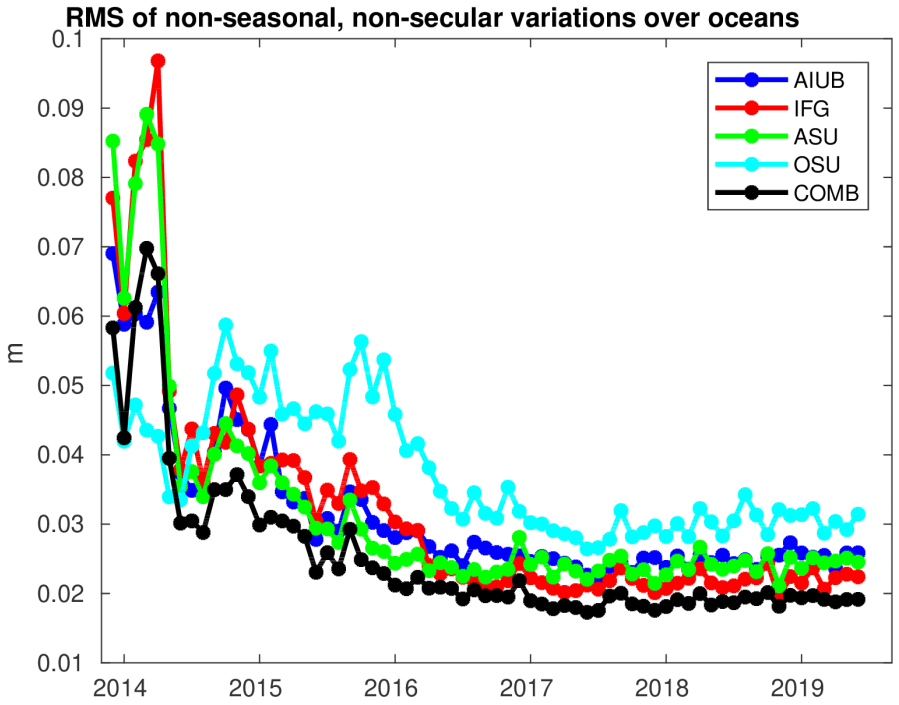
Variance Component Estimation



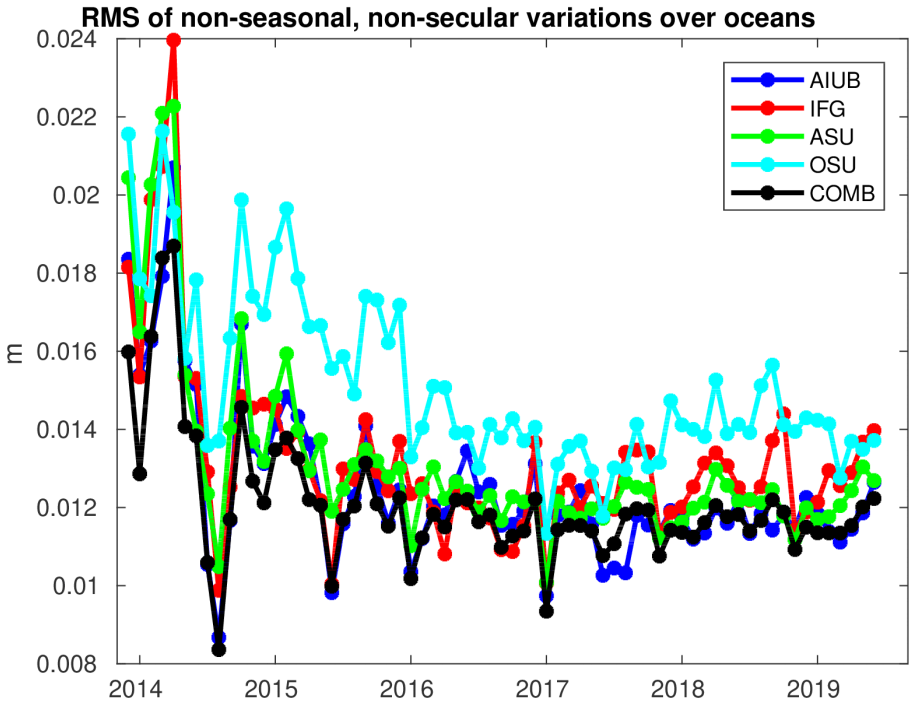
COST-G: Validation



Noise Levels of Swarm Gravity Fields

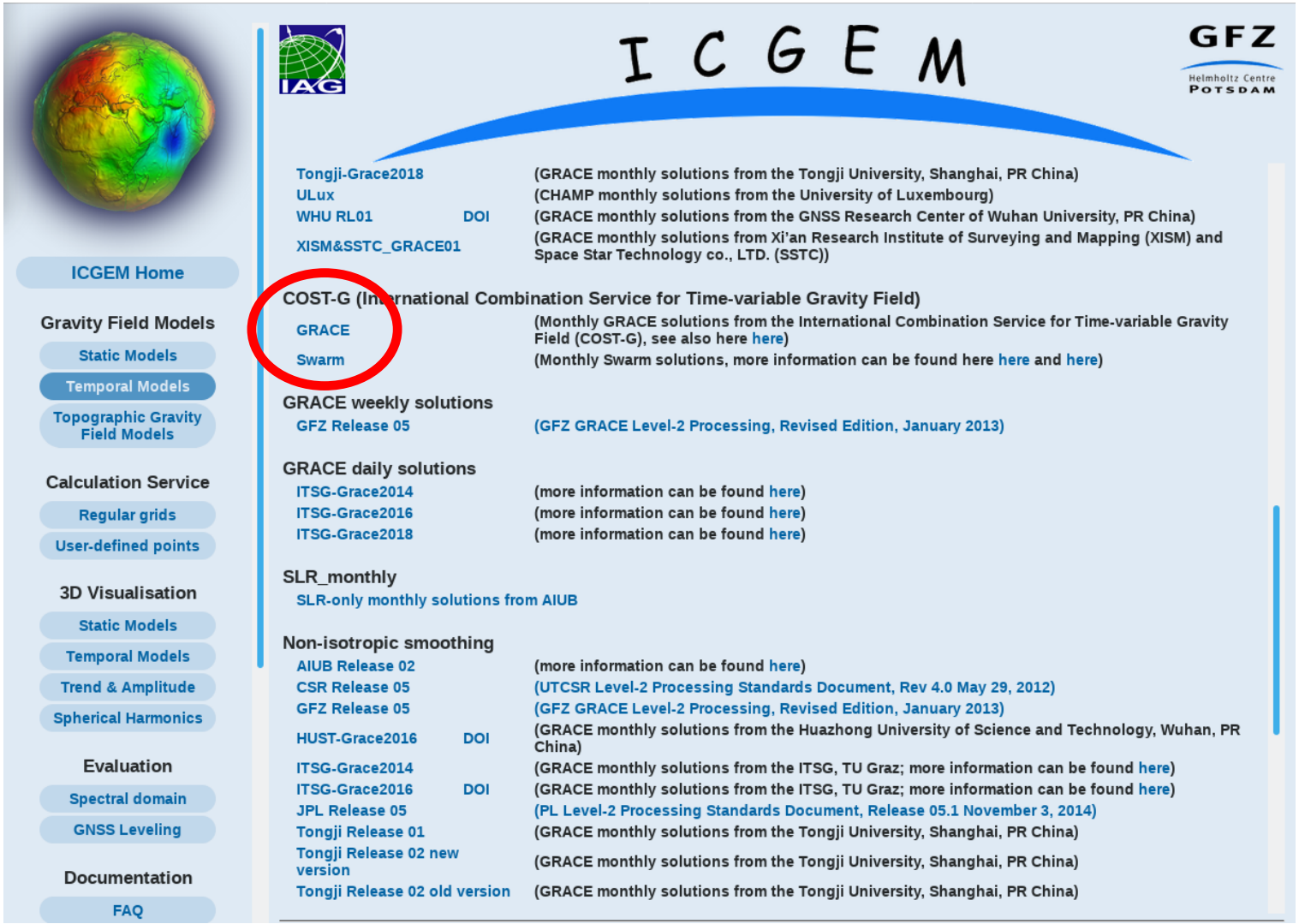


Unfiltered

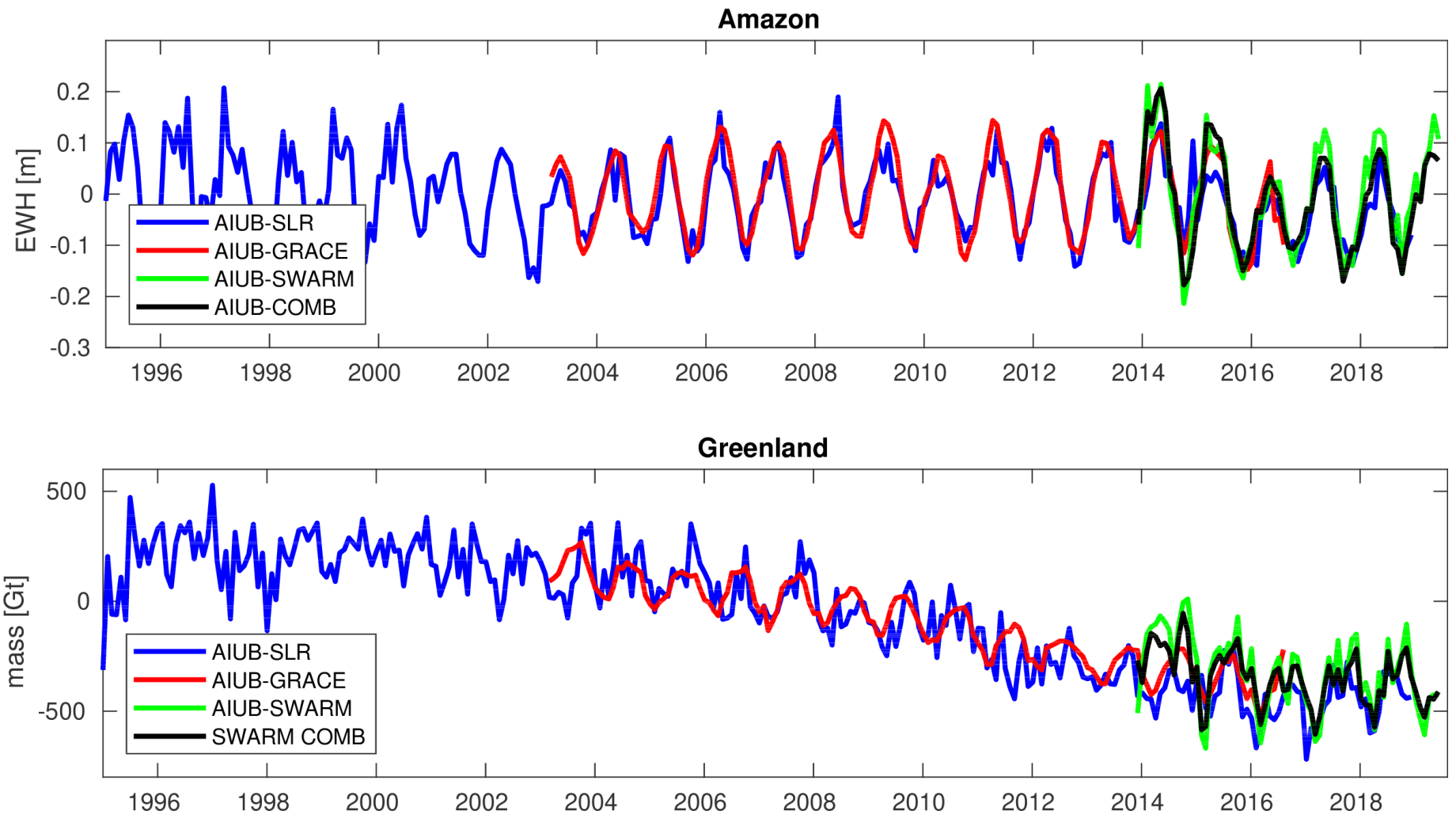


Smoothed by 400 km Gauss filter

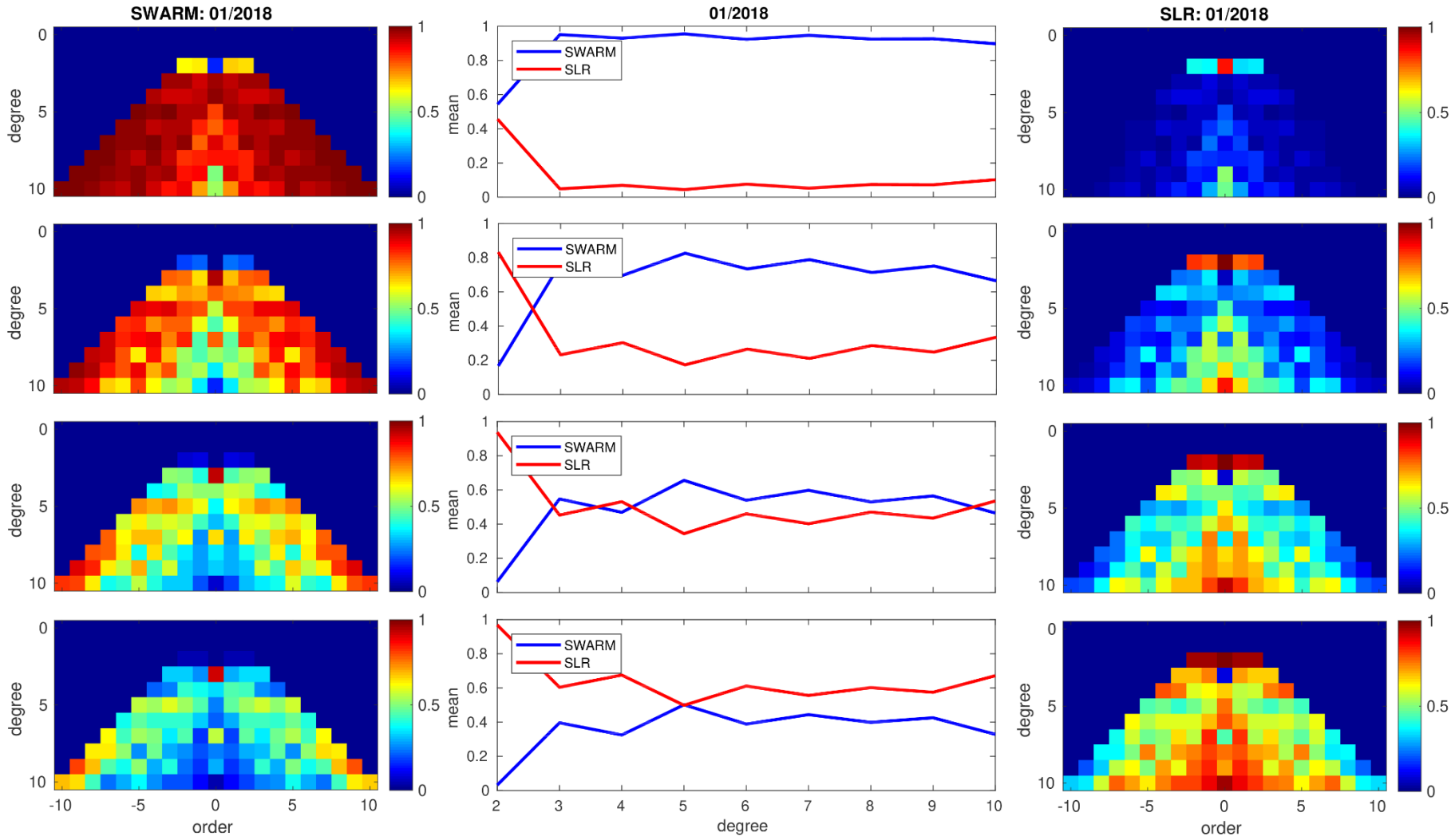
Product Dissemination



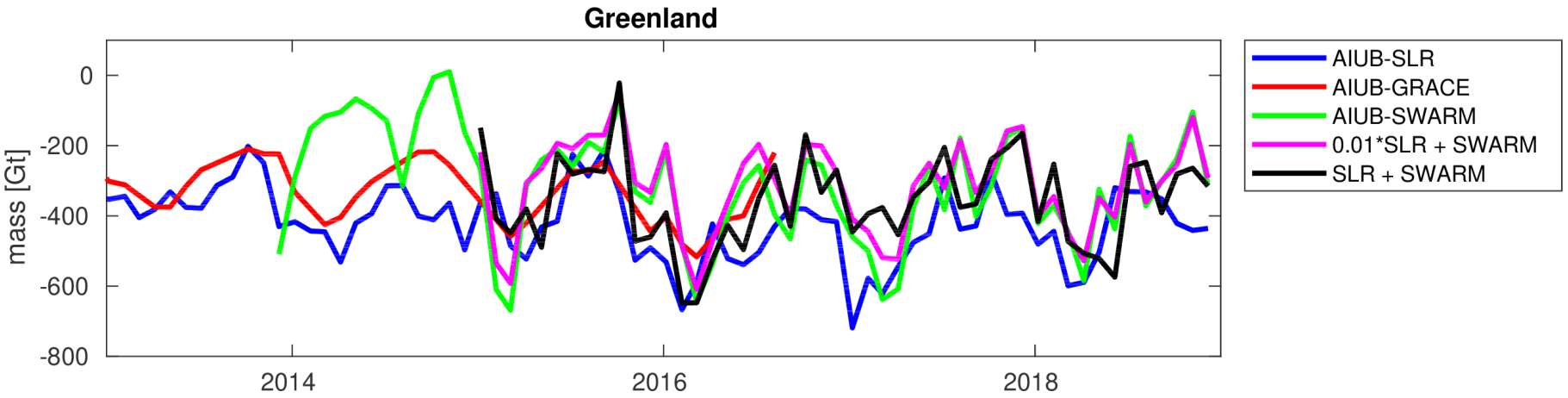
Application of Swarm Gravity Fields



Swarm / SLR Combination



Swarm / SLR Combination



Conclusions:

- Swarm monthly gravity fields are determined by several analysis centers (AIUB, ASU, IfG, OSU)
- Swarm gravity fields are combined by COST-G, the new product center of the IGFS (IAG)
- L2 products (spherical harmonic representation) are available at ICGEM
- Swarm gravity fields are useful, e.g., to bridge the gap between GRACE and GRACE-FO