

IERS workshop on Global Geophysical Fluids (GGFC)

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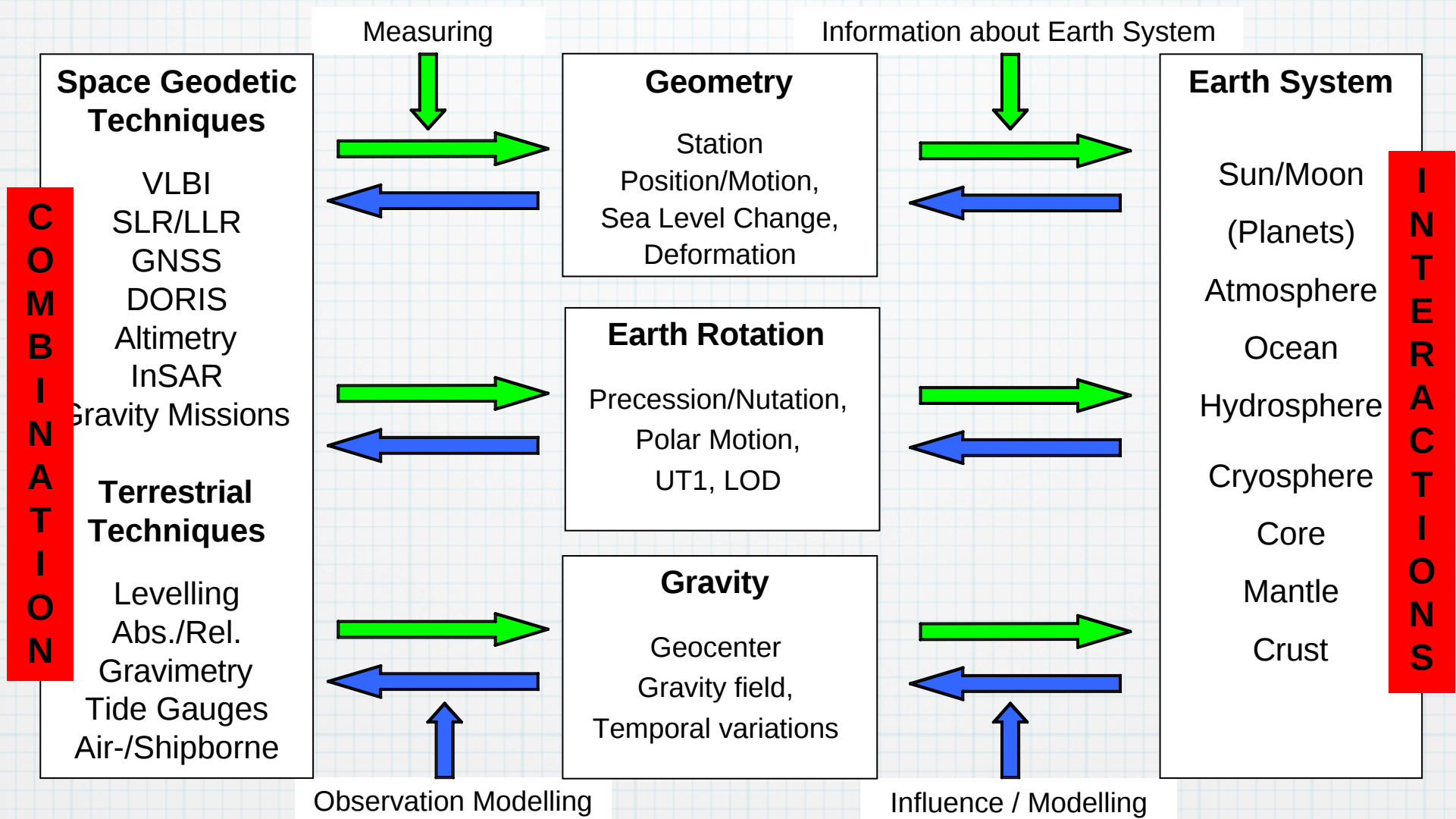
What is the IERS GGFC?

- * Established in 1998 by the IERS with:
- * a collection of Special Bureaus (SBs), defined by the different fluids acting on (e.g. Atmosphere and Oceans) or within the Earth (Mantle and Core)
- * the idea of the SBs was to provide Earth models, fluid models (e.g. hydrology and tides) or modeled of geodetic effects (e.g. Earth rotation and deformation) generated by the different fluids

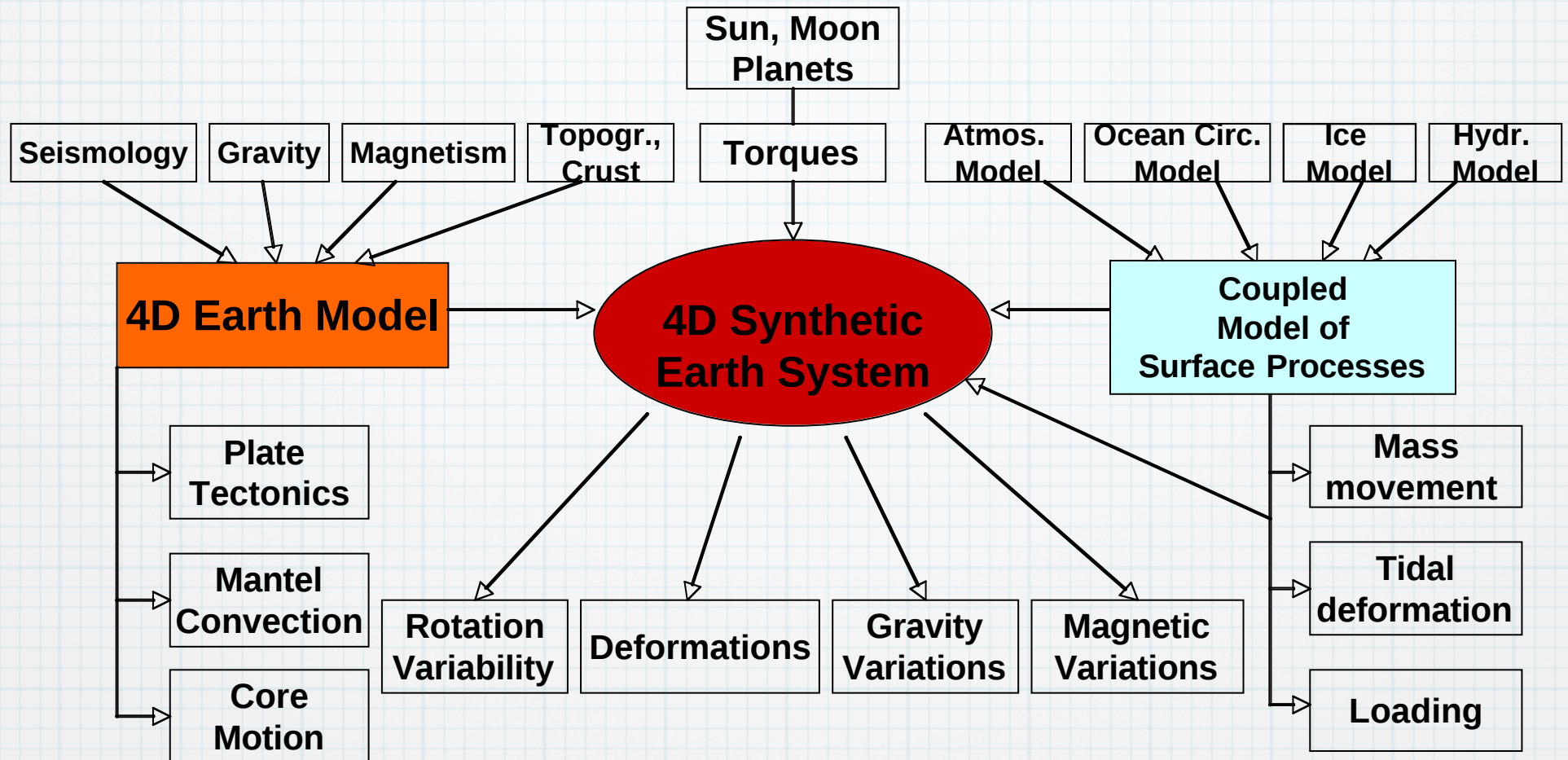
The GGFC is fundamentally interdisciplinary. The data products involved include:

- Š Geodetic measurements of temporal variations of Earth's rotation vector, gravity field in Stokes coefficients, geocenter, and surface deformations;**
- Š Global geophysical fluids data directly related to the above, including pressure fields of atmosphere and oceans, wind and current fields, tides, and temperature/salinity profiles derived from atmospheric and oceanic general circulation models (GCM);**
- Š Observed and/or modeled data sets for land water and snow/ice mass distribution, mass flow fields in the fluid core, and solid-Earth surface deformations due to tides, seismicity, tectonics, post-glacial rebound, environmental mass loading, and anthropogenic effects;**
- Š Ancillary data products from satellite missions (some are assimilated into the GCMs in (2)), including ocean altimetry, (future) laser altimetry, ocean scatterometer, and geomagnetic field.**

Measuring and Modeling the Earth's System

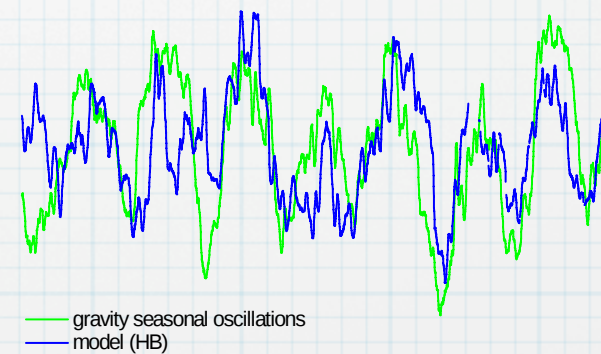
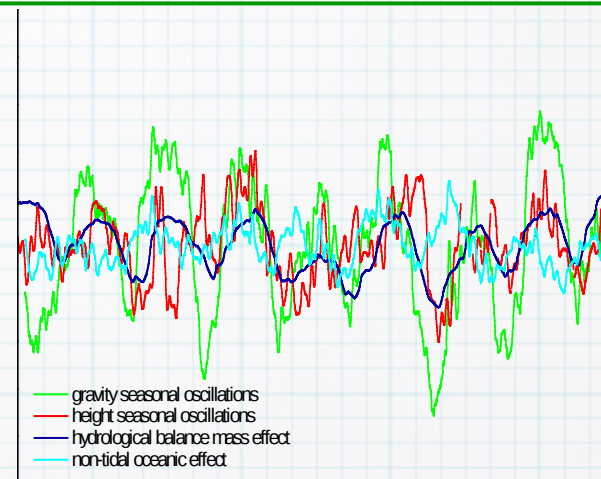
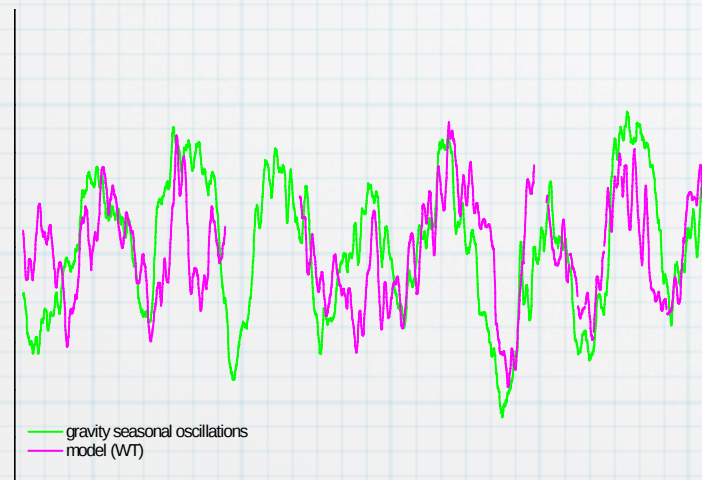
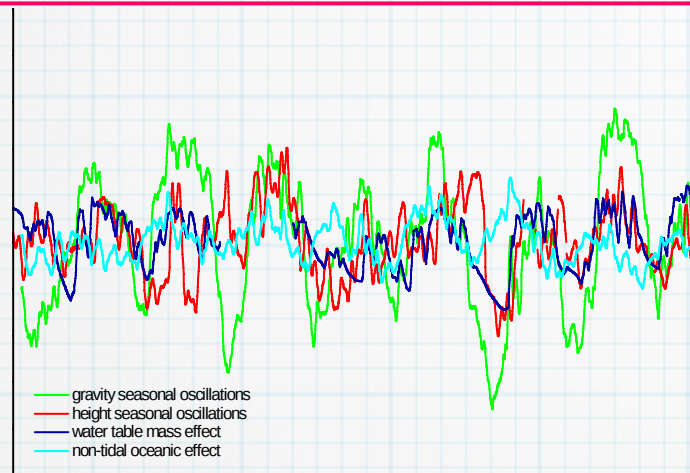


Measuring and Modeling the Earth's System



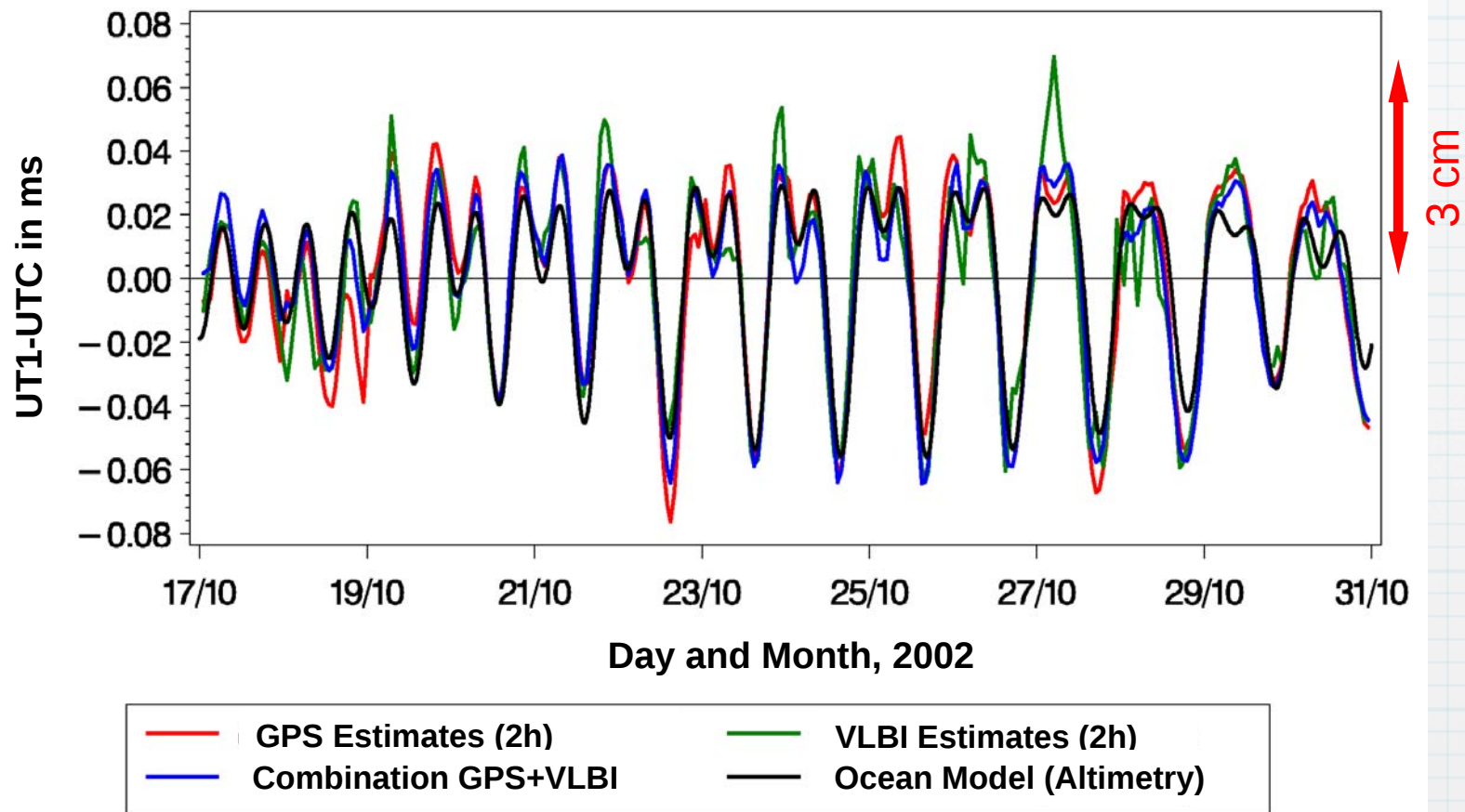
**Evaluation, Iteration,
Assimilation**

Modeling of System Earth: Gravity/Deformation



Earth Rotation: Subdaily Resolution

Comparison of Earth Rotation Parameters for CONT02
UT1-UTC



Comb. - Model: 4.5 mm

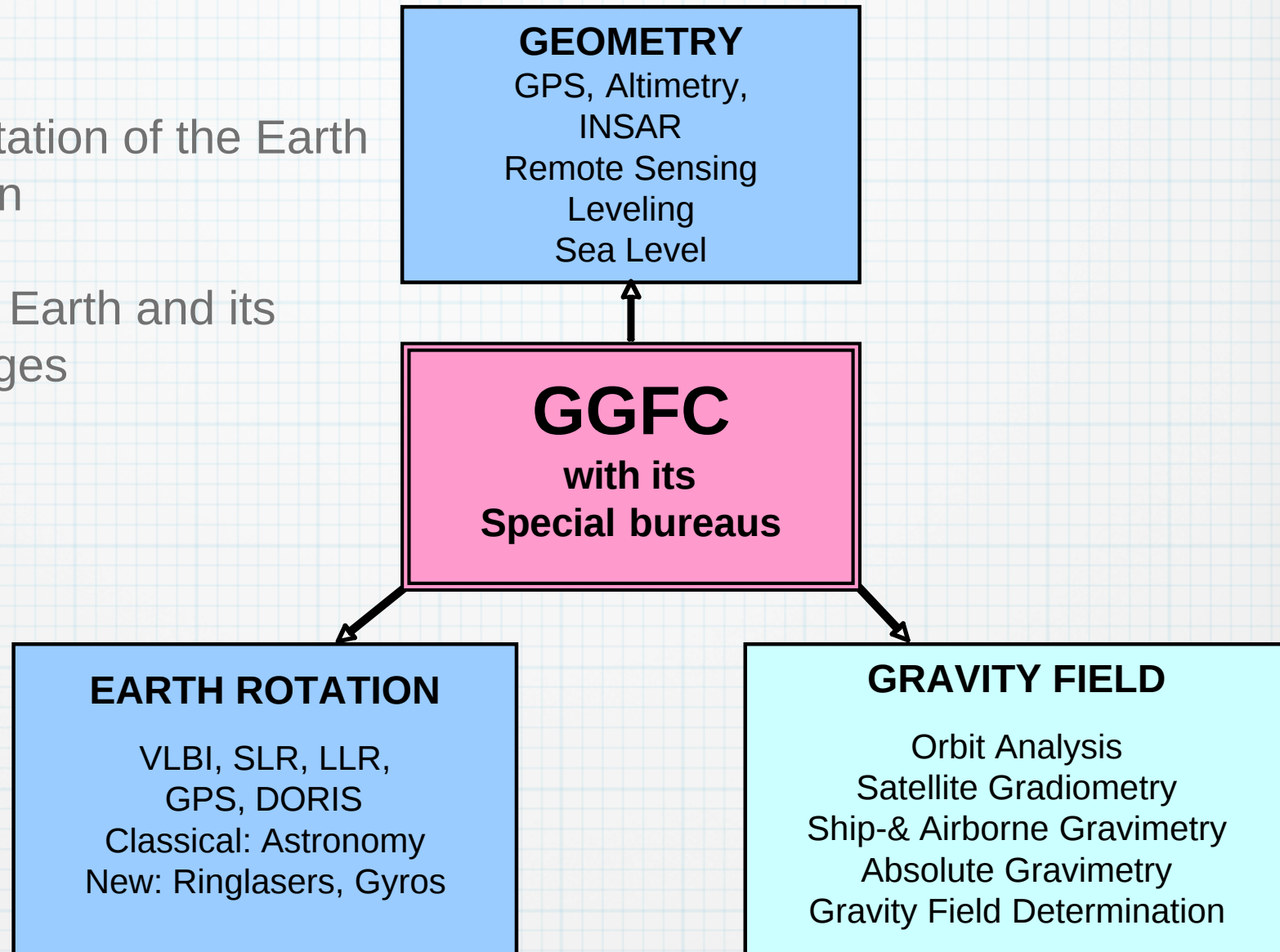
GPS - Model: 5.4 mm

VLBI - Model: 5.8 mm

Geometry and deformation of the Earth

Orientation and rotation of the Earth and its variation

Gravity field of the Earth and its temporal changes



GGOS request

- * encourage the GGFC Sub-bureaus to play an important role in GGOS by providing geophysical fluid data products for deformation, Earth rotation and gravity**

questions to consider (1)

- * consistent whole-earth models for rotation, geocenter, loading, geopotential changes, etc. which brings up the issue of self-consistency
- * are all products available for all fluids?
- * are multiple sources available for each?
- * what missing products require new developments or efforts?
- * are convenient geodetic units used?
- * what is the accuracy of the component products and how is this assessed?

questions to consider (2)

- * is the accuracy adequate for modern research purposes?
- * maybe the ggfc should provide component/combined products so users do not have to guess which products are reliable?
- * what is the spatial/temporal resolution of each product? is it adequate for current needs?
- * are the products consistent between special bureaus? e.g. are loading displacements consistent with AM and geocenter for given models?

questions (3)

- * **GGFC and the SBs are strictly scientific services**
- * **In most of the cases no commitments**
- * **Is this a model for the future?**

workshop goals

- * review current status of the GGFC
- * try to understand the requirements of the current geodetic community
- * evaluate if and how the GGFC must reorganize to address the current requirements
- * more or different fluid models (GRACE)? software? uniformity of data products and units?

workshop layout

- * invited speakers to give us an overview of the community needs and products that should be included
- * review of the status of the special bureaus
- * open forum for discussing changes