The GFZ Integrated Solution

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Motivation

EPOS-OC is a multi satellite, multi observation type, multi parameter type S/W, Combination on the Observation Level is just there

We put some efforts already in solvability, separability and accuracy of the dynamic and geometric Earth system parameters (geocenter, orientation) from the CHAMP-GRACE-GPS constellation

Here we face the chance for comparison of coordinates, EOPs, troposphere, ..., in an international group

The Integrated Approach

Simultaneous dynamic modelling of an ensemble of satellites

Simultaneous solution of all orbits from an ensemble of tracking types

Simultaneous solution of an ensemble of parameters

- Dynamic
  - Orbit
  - Low degree harmonics
  - ...
- Geometric
  - Station coordinates
  - EOPs
  - ...

The Solution gfz<yy><doy>cPLcd01

GRACE-GPS constellation

Observations:

- GPS code and phase data, GPS-constellation to GPS ground network (GPS ground)
- GPS code and phase data, GPS-constellation to GRACE-A and -B (GPS SST)
- GRACE K-band range rates, GRACE-A to -B (KRR)
- SLR normal point ranges, SLR ground network to GRACE-A and -B, and to GPS-5 and -6 (SLR NP)

Models

- Gravity field EIGEN-GL04C 120x120
- Short term mass variations GRACE RL04
- A priori station coordinates ITRF2000/IGS2000
- A priori EOPs EOP04C05

The Solution gfz<yy><doy>cPLcd01, II

Weighting

GPS ground code	1.000 m
GPS ground phase	0.010 m
GPS SST code	0.700 m
GPS SST phase	0.007 m
SLR NPs	0.010 m
KRR	0.25 µm/s

Parameters in SINEX

Station coordinates	constraint 1 m a priori
EOPs (polar motion, UT1-UTC)	constraint 1 m equivalent a priori

The Solution gfz<yy><doy>cPLcd01, III

Processing

1-d arc

Runtime 6 h

6,500 unknowns

2,800,000 observations

2,700,000 GPS ground

60,000 GPS SST

17,000 KRR

100 SLR Nps

SINEX conversion of EOP a priori constraints failed for re-scaling

Next Plans

Re-supply SINEX with correct MATRIX_APRIORI L INFO

Add CHAMP

Add LAGEOS and LAGEOS-2

Add altimetry satellites (new observation types: altimeter crossover, DORIS)