Federal Agency for
Cartography and Geodesy

EPN Reprocessing
- Weekly Combination -

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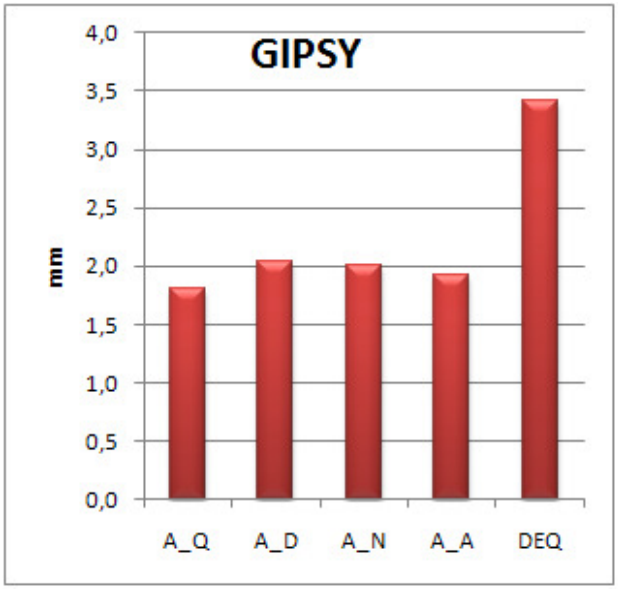
Benchmark Test

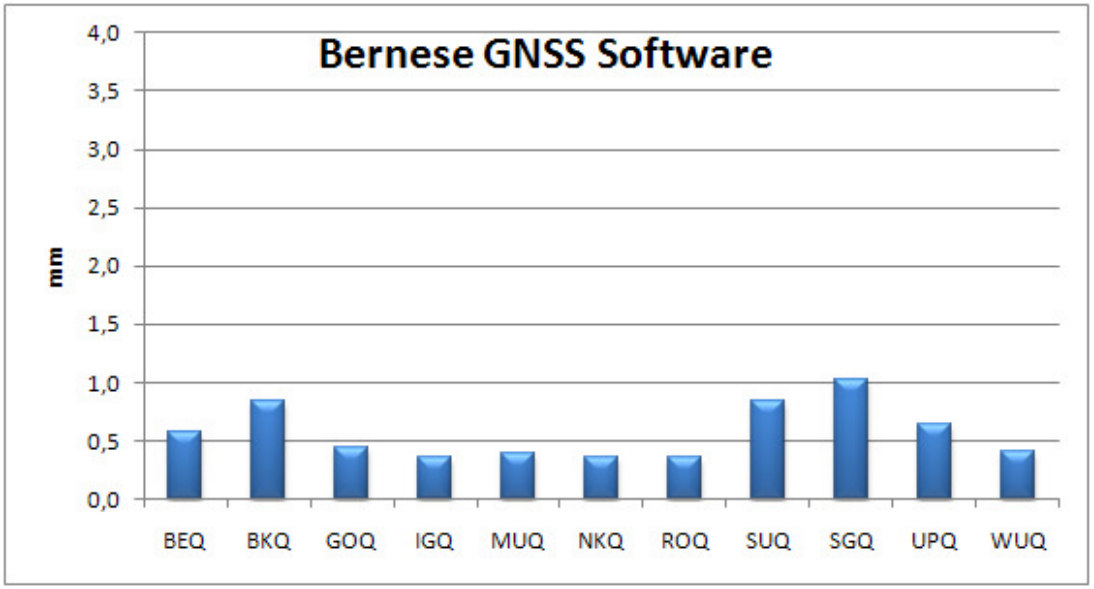
- 30 common EPN Sites analysed by LACs
- week 1381
- *here:* Investigation of weekly solution
- Bernese GNSS Software
  - 11 contributions
- GIPSY software
  - 5 contribution (4 ASI + 1 DEO)
  - modification of options regarding
    - PPP vs. network mode
    - ambiguity float vs. fixed
    - datum definition (apply so-called JPL xfile)
- GAMIT software
  - 1 contribution

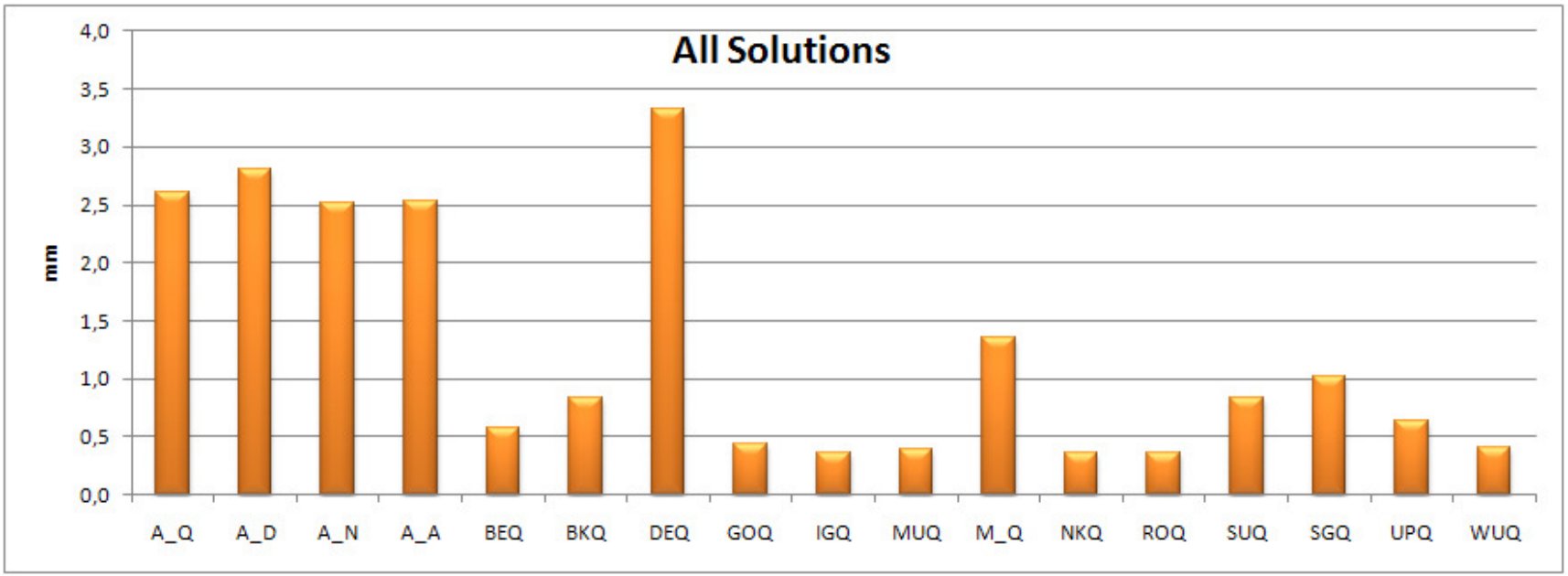
Benchmark Text Results

- Proof of consistency of contributing solutions
  - RMS of Helmert transformation (individual vs. combined) used as quality indicator
  - particular estimated Helmert parameters are out of interest, because they are affected by large residuals of single stations
- Discrepancies between various GIPSY solutions are much smaller than the GIPSY to Bernese software deviation
- Discrepancy between GIPSY and Bernese software solution is rather caused by station-specific differences than network effects

RMS Helmert Transformation







Helmert Transformation Example

EUQ VS. A_A

RMS OF TRANSFORMATION : 2.8 MM

PARAMETERS:

TRANSLATION IN X	:	0.8	+- 0.6	MM
TRANSLATION IN Y	:	-0.5	+- 0.6	MM
TRANSLATION IN Z	:	1.2	+- 0.6	MM

STATION	RESIDUALS (MILLIMETERS) N	E	U
HOFN 10204M002	5.0	-6.0	-0.4
JOZE 12204M001	-1.4	1.1	-11.1
LAMP 12706M002	-5.9	1.8	-0.8
MALL 13444M001	-4.9	-5.6	18.1
METS 10503S011	5.6	1.4	-5.5
SFER 13402M004	-6.1	0.3	-1.6
TRO1 10302M006	5.5	0.8	-7.3

threshold 5 mm horizontal, 10 mm vertical

stations in red outstanding in all ASI approaches

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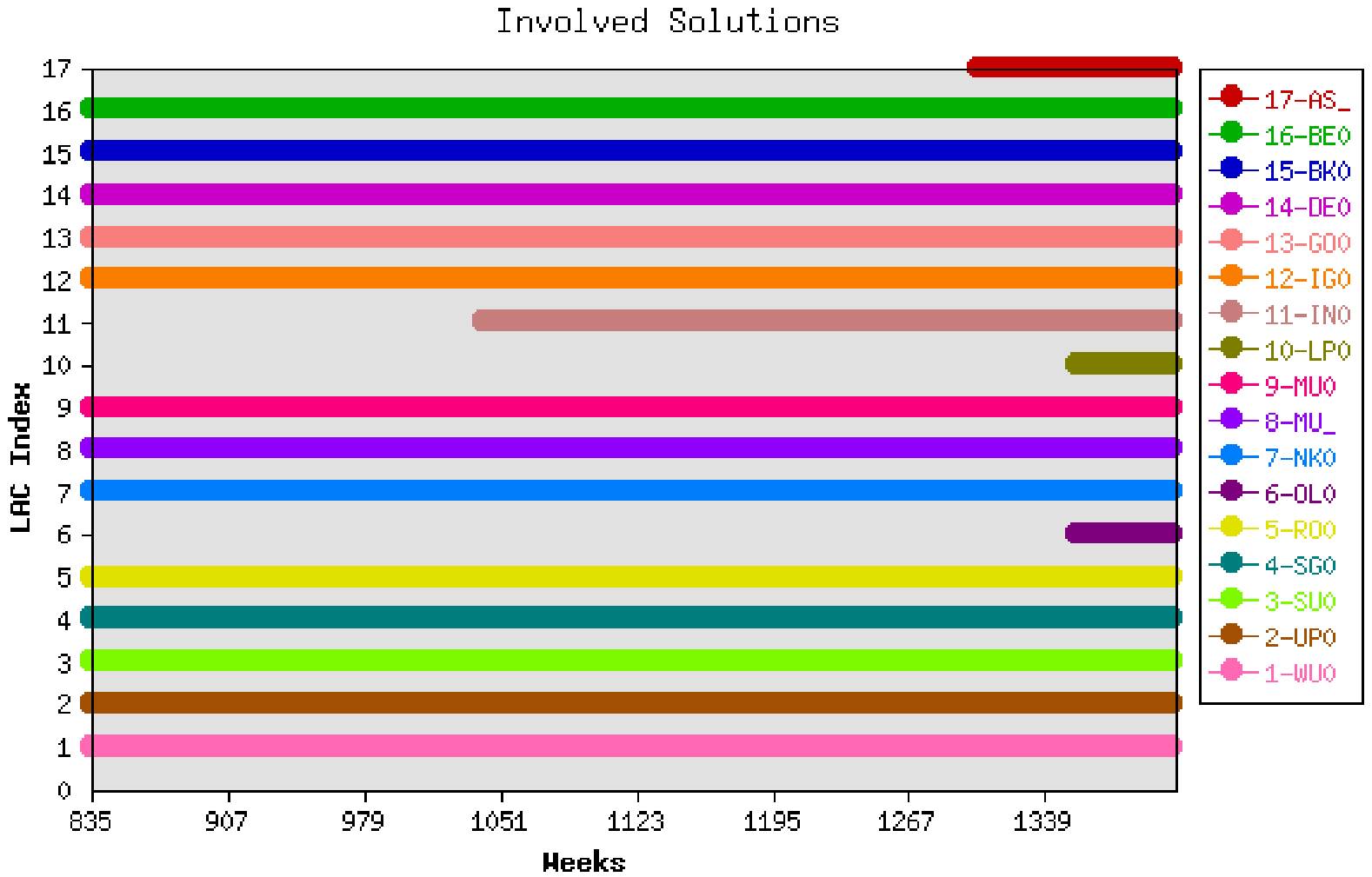
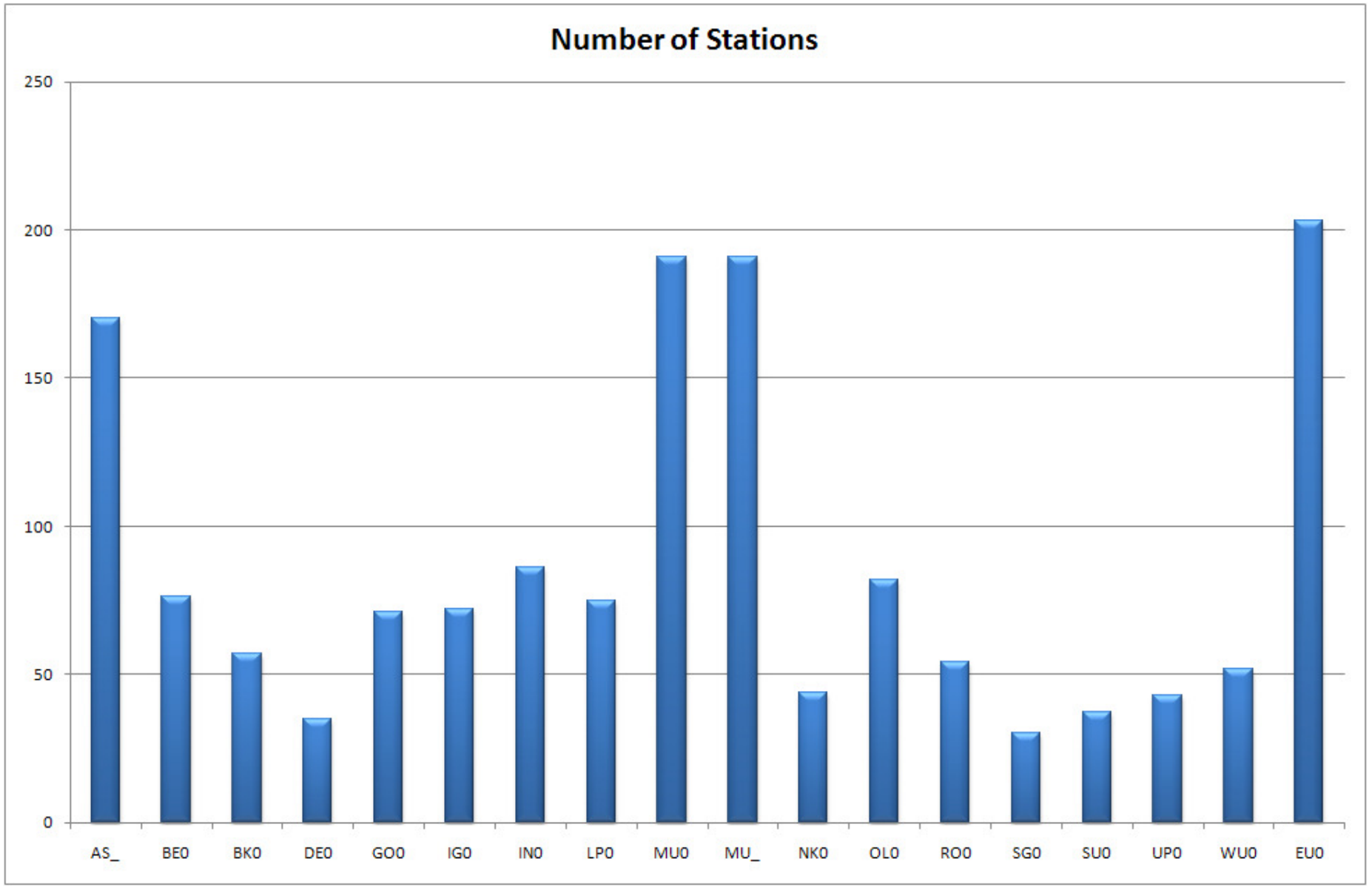
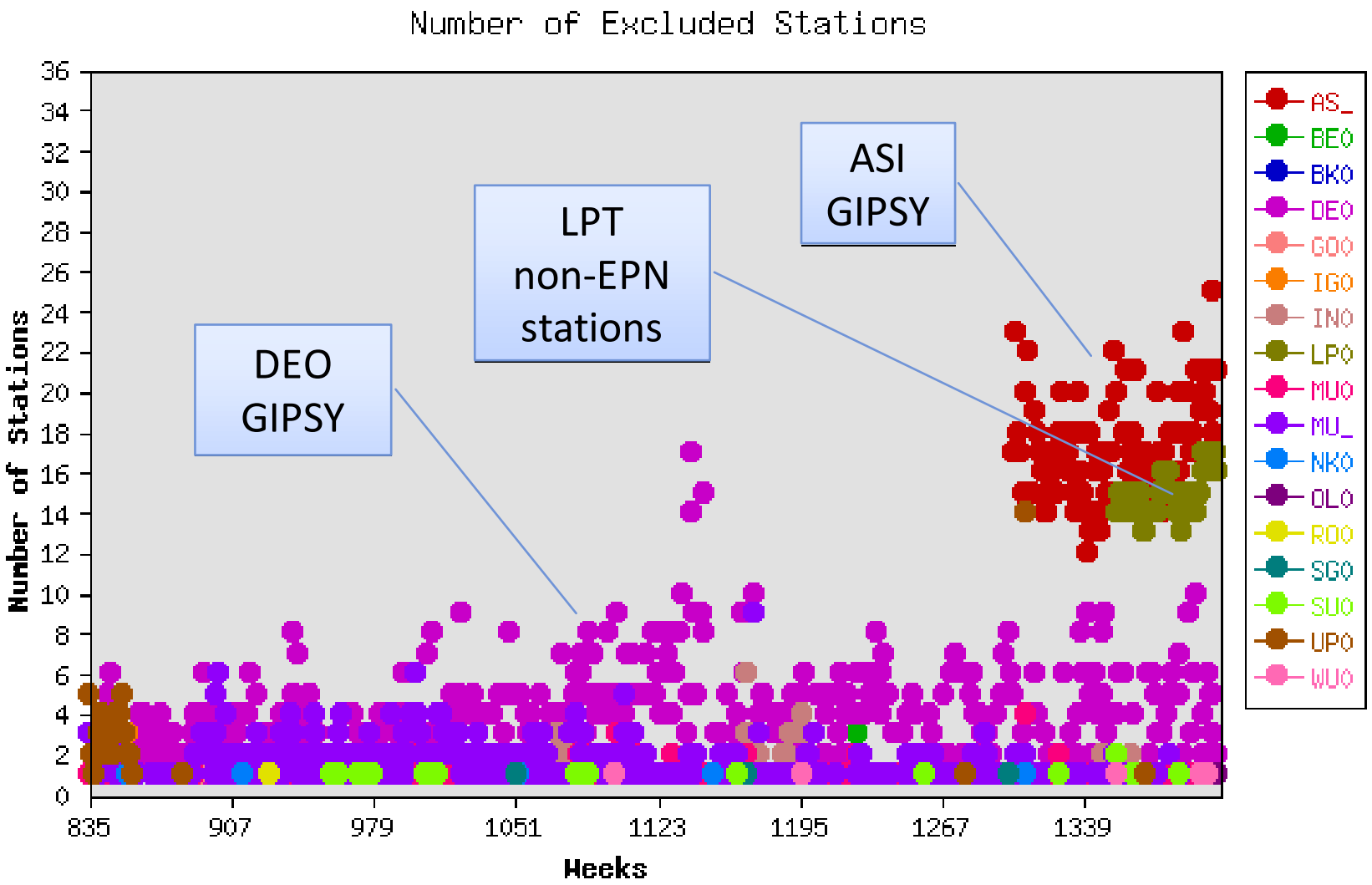
Actually Combined Weekly Solutions



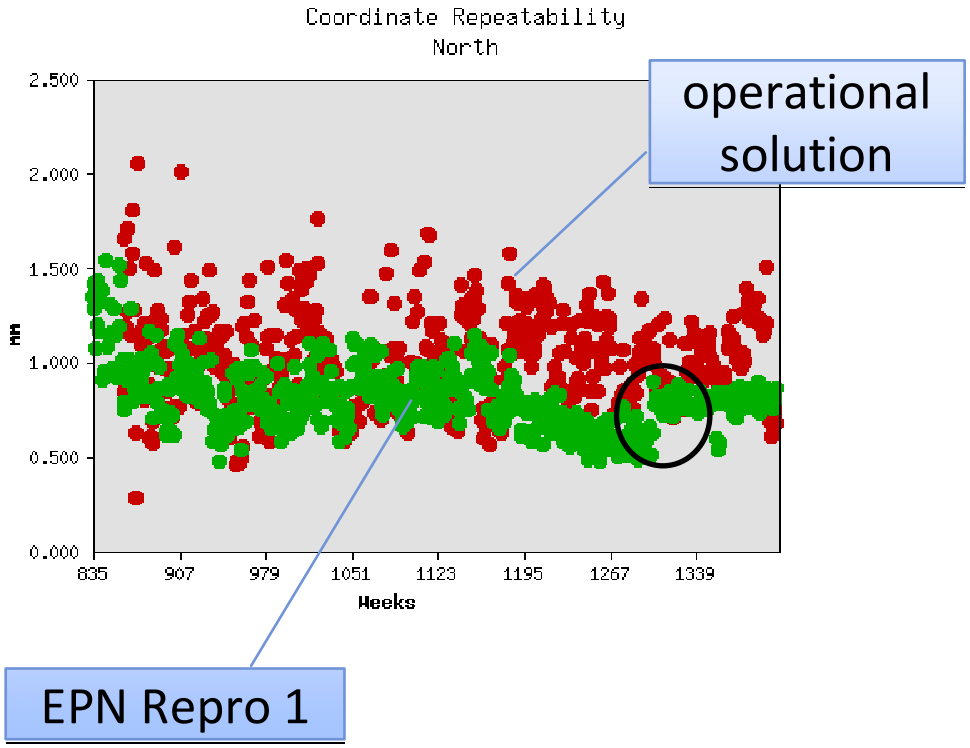
LAC's Network Size

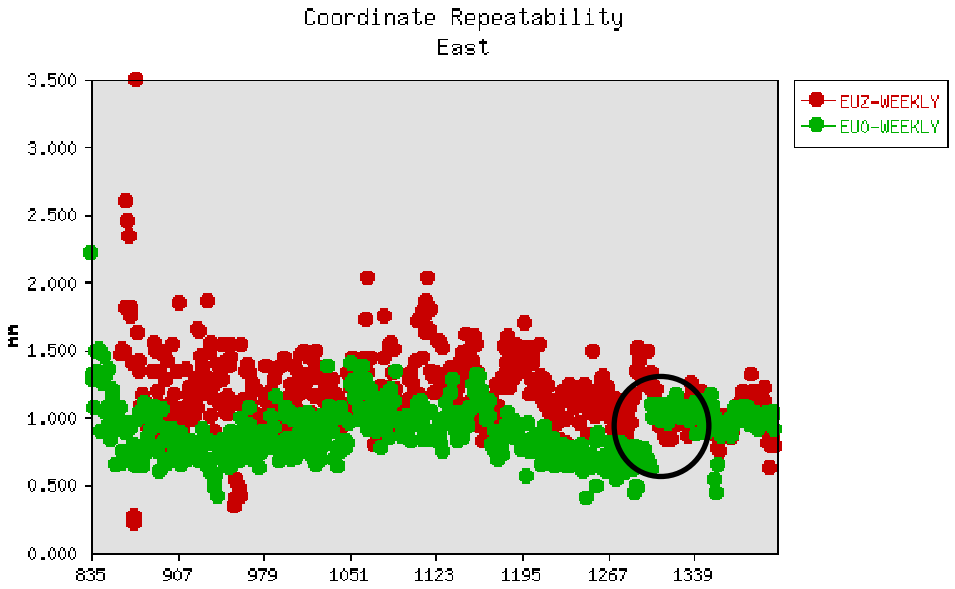


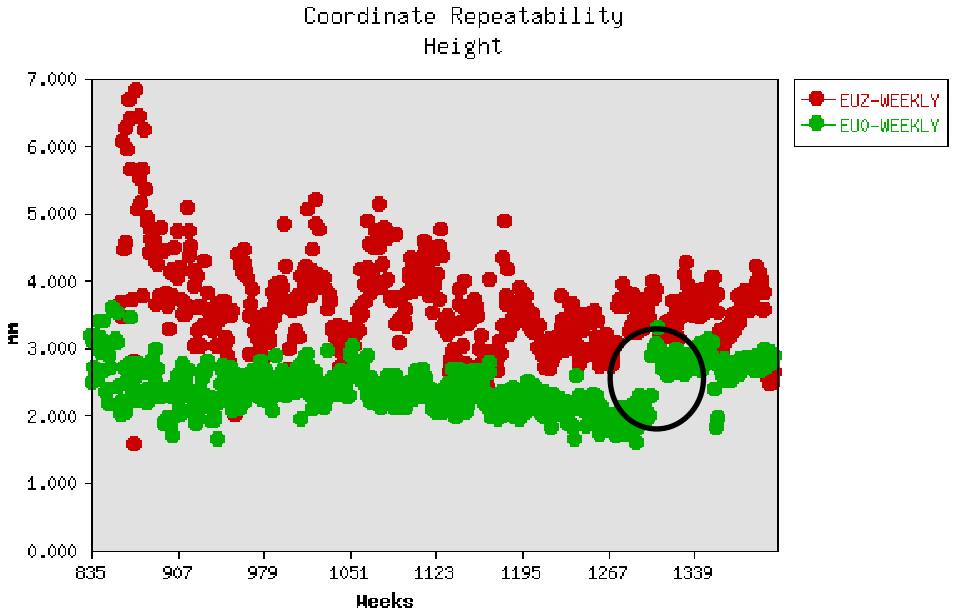
Station Exclusions



Consistency of LAC Contributions







Conclusion from the Weekly Combination

- Discrepancy between solutions from different analysis software recovered in benchmark test, where some model differences are known (e.g., troposphere mapping function)
- Discrepancies are rather station-dependant than affected by network
- All contributions were applied for the combination, because no decision about the correct solution is possible
- Improved consistency between LACs in Repro1 compared to operational solutions
- Homogenization of analysis models for future reprocessing