



~~GGOS Working Group~~ Standing Committee PLATO (Performance Simulations and Architectural Trade-Offs)

Daniela Thaller, Richard Gross

*Meeting of GGOS Bureau for Networks and Observations,
Vienna, April 20, 2016*



Meetings

2014, May 1st, EGU in Vienna:

- 20 participants
- Presentations by WG members about their contribution to PLATO

➡ Assignment of the work to the tasks of the WG

2015, April 13, EGU Vienna:

- 16 participants
- Reports about the work started / in preparation

2016, April 21, EGU Vienna:

- Reports about the work started / in preparation

Task 1: Next generation space-geodetic stations



Topics to be studied	Simulations done by ...	Analysis done by ...
Optimal method of deploying next generation stations	GFZ GSFC (VLBI scheduling) IfE (LLR) TUW (VLBI)	
Impact of current legacy network (data degradation, station closing, stations re-locating)	GFZ IfE (LLR) JCET /GSFC	NRCAN (VLBI)
Trade-off between <ul style="list-style-type: none"> - number of stations - accuracy of observations 	IfE (LLR) JCET / GSFC	

Task 2: Improving the ground network (global coverage, co-location)



Topics to be studied	Simulations done by ...	Analysis done by ...
Network of ground stations (number and distribution)	BKG DGFI JCET / GSFC JPL	TUW (VLBI)
Trade-off between number of stations from different techniques	JCET / GSFC	
Additional station / arrays for LLR	IfE	
Network of co-located sites (number and distribution)	DGFI GFZ GSFC / JCET	
Trade-off between co-locating - all techniques at all sites - some techniques at some sites	DGFI	

Task 3: Improving the site ties



Topics to be studied	Simulations done by ...	Analysis done by ...
Accuracy of site ties / impact of errors in local ties	DGFI GFZ	BKG/AIUB (GNSS-SLR)
Optimal weighting of local ties in the combination		DGFI

Task 4: Co-locating techniques in space -1-



Topics to be studied	Simulations done by ...	Analysis done by ...
<p>Impact of co-locations in space:</p> <p>a) On GNSS</p> <p>a) On LEOs</p> <p>b) New special co-location satellites (e.g. GRASP)</p>	<p>a) ETHZ</p> <p>b) ETHZ</p> <p>c) DGFI GFZ (NanoX, GRASP) JPL (GRASP)</p>	<p>a) BKG/AIUB DGFI</p> <p>b) DGFI (Jason-2)</p> <p>c) -</p>
<p>Trade-off between</p> <ul style="list-style-type: none"> - co-locating techniques in space - number / distribution of ground stations 		
<p>Trade-off between co-locating techniques in space and on the ground</p>		<p>BKG/AIUB (GNSS-SLR)</p>

Task 4: Co-locating techniques in space -2-



Topics to be studied	Simulations done by ...	Analysis done by ...
Trade-off between - number of co-locations in space - # observations per space co-location	BKG/AIUB (GNSS-SLR)	BKG/AIUB (GNSS-SLR)
Additional data sets: a) SLR data to GNSS / LEOs a) SLR data to spherical sats b) LLR c) VLBI to GNSS satellites a) VLBI transmitter on moon b) Inter-satellite link c) New satellites / constellations	a) ETHZ b) c) d) ETHZ TUW e) IfE f) g) DGFI	a) BKG/AIUB DGFI b) DGFI c) d) ETHZ TUW e) - f) g) -
Accuracy of space ties / impact of errors in space ties	BKG/AIUB (GNSS-SLR) ETHZ	BKG/AIUB (GNSS-SLR)



Work done (-1-)

- Simulation of VLBI data for global TRF solutions studying the impact of different noise levels
- Testing different observing scenarios in order to get the best use of sibling telescopes (legacy VLBI telescope + fast VGOS antenna at the same site; example Hobart)
- Testing different schedules of VLBI satellite observations
- VLBI observations to GPS satellites (baseline Ceduna to Hobart in Australia) and their contribution to TRF



Work done (-2-)

- Combination of SLR and GPS/GNSS ground and LEO data (Jason -2, GRACE-A/-B, GOCE, T/P)
- GRASP / E-GRASP simulations: space segment with 4 techniques onboard
- Multi-satellite SLR solutions: Simulations and real data analysis (LARES, LARES-2, BLITS M, BLITS GEO, etc.)
- Investigating the impact of SLR@GNSS to combined SLR-GNSS solutions
- LLR simulations, e.g., 3 new reflectors on the moon



Work done (-3-)

- Simulations for different designs of SLR networks
- Simulations on system accuracy
- Simulations for changing network geometry and quality of data, for globally distributed co-located core sites

- Simulations for network size of co-located SLR-VLBI sites
- Simulations on accuracy of local ties
- Improving the Local Ties of a Fundamental Station by a Multi-Technique Ground Target (example Wettzell)

Presentations related to PLATO



- EGU 2015, Vienna
- IUGG General Assembly 2015, Prague
- ILRS Technical Workshop 2015, Matera
- AGU 2015, San Francisco
- IVS General Meeting 2016, Johannesburg
- EGU 2016, Vienna