

IERS Retreat: Session 2

Rigorous combined products



Main Themes

1. Should we include the ICRF in the current ITRF combinations that already include EOPs?
2. Should we generate the regular operational EOP updates from combinations of SINEX solutions provided by the four techniques?
3. What is the current status of the combination at the observation level (COL) and how it could contribute to the IERS products in the future, when it becomes mature enough?



Session 2 : Agenda

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| • Introduction | 30 minutes |
| – Z. Altamimi | 10 |
| – M. Seitz | 10 |
| – Questions/additions | 10 |
| • Theme 1: ICRF issues | 60 |
| – Ch. Jacobs, R. Gaume, C. Ma | 20 |
| – Discussion | 40 |
| • Theme 2: EOPs issues | 60 |
| – D. Gambis & B. Luzum | 20 (10 each) |
| – R. Gross | 10 |
| – Discussion | 30 |
| • Theme 3: COL issues | 30 |
| – R. Biancale & D. Thaller | 20 (10 each) |
| – Discussion | 10 |



Theme 1: ICRF and its relation to ITRF & EOPs (1/3)

- Brief description of how the ICRF is currently realized?
- What are the most demanding applications and who are the users of the ICRF?
- What are the user requirements in terms of precision, accuracy and latency?
- **How the current ICRF implementation made consistent with the ITRF and EOPs:**
 - What is the current level of consistency?
 - What is the needed level of consistency from the ICRF user applications' point of view?



Theme 1: ICRF and its relation to ITRF & EOPs (2/3)

- Does the current practice meet the user need and requirements? Are there weaknesses to mitigate?
- What are the plans for the next ICRF realization?
- Do we need to include the ICRF in the ITRF combinations that already include EOPs? What is the opinion of the ICRF WG?
- Is there a utility for daily (or weekly) ICRF products, and if yes, how best to achieve that?



Theme 1: ICRF and its relation to ITRF & EOPs (3/3)

- Would the ICRF WG agree to use IGS Polar Motion (instead of VLBI/IVS values) for its high precision and best alignment to ITRF already guaranteed by the IGS ?

Theme 2: Regular operational EOP updates (1/3)

- Description of the current practice on how the regular operational EOP updates are generated and aligned to the ITRF: Bulletins A and B;
- Are the frequency and latency of the current IERS EOP series updates adequate?
- Quality and accuracy assessment of the current IERS EOP products,
 - Consistency with the ITRF ?
- Should we generate the regular operational EOP updates from combinations of SINEX solutions provided by the four techniques?



Theme 2: Regular operational EOP updates (2/3)

- What are the limiting factors and barriers for daily combinations of the SINEX files generated by the techniques (IVS, ILRS, IGS, IDS):
 - IGS daily products are available: adequate for capturing seasonal effect
 - Latency for the other technique
 - Poor VLBI and SLR network geometry and co-locations at daily sampling,
 - (non)-availability of SLR and DORIS daily solutions ?
 - non-availability of VLBI sessions every day with limited number of TRF-type sessions,
 - Local ties and discontinuities in the time series?



Theme 2: Regular operational EOP updates (3/3)

- **Alternatives** to daily SINEX combinations: suggestions towards improving the IERS regular operational EOP products, by, e.g.
 - “Adopting” (or giving more weight to) IGS daily polar motion in the regular operational EOP updates, for its **high precision and best alignment to ITRF already guaranteed by the IGS**;
 - Adopting/Fixing IGS polar motion in the IVS intensive sessions, so to improve the accuracy of UT1 determination by IVS, as well as its consistency with the ITRF.

Theme 3: Combination at the observation level (COL)

(1/2)

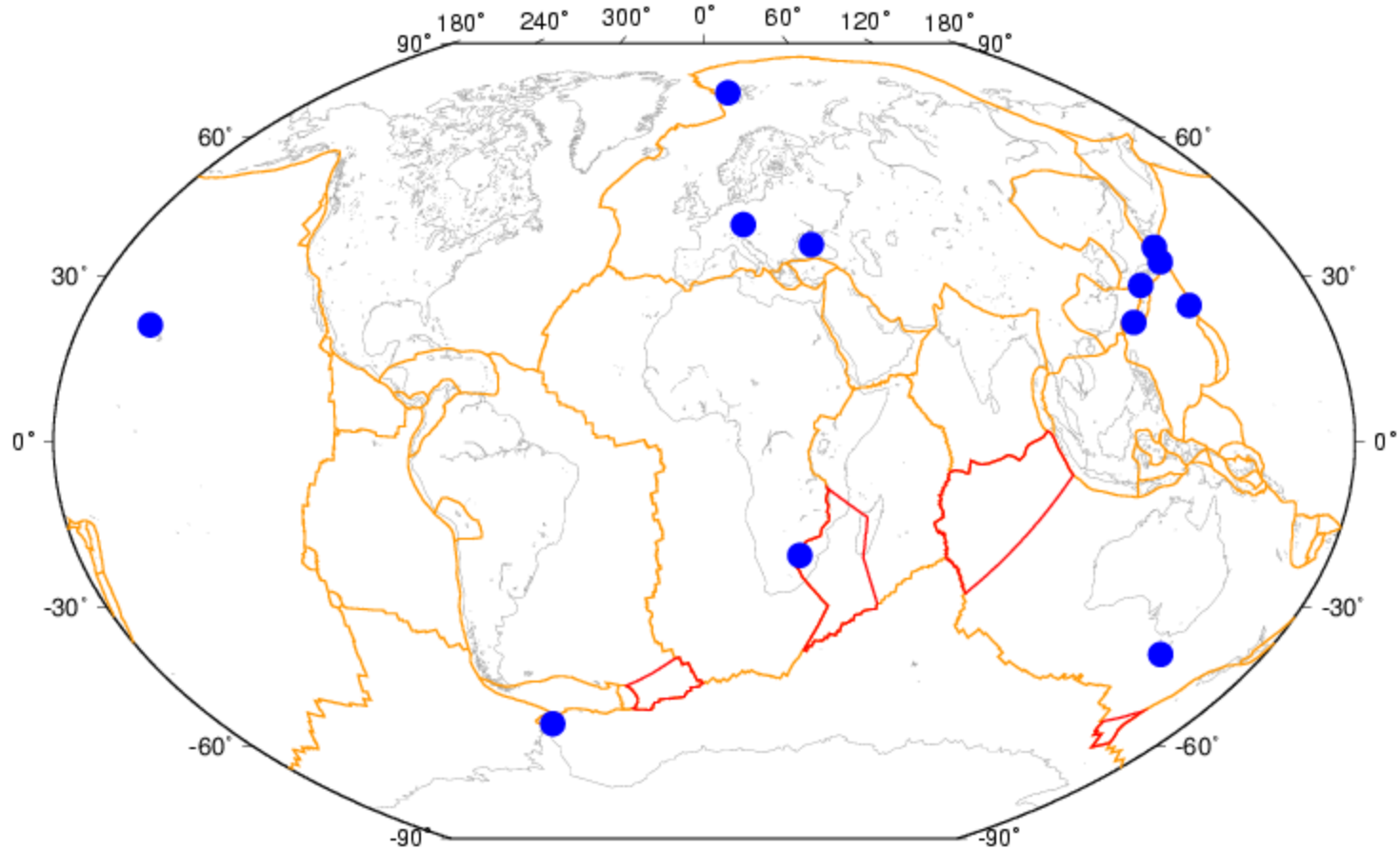
- Briefly recall the advantages of the COL
- **What are the limiting factors for COL:**
 - latency and availability of technique observations,
 - poor VLBI and SLR network geometry and co-locations at daily sampling,
 - noise level of VLBI, SLR and DORIS daily solutions,
 - non-availability of VLBI sessions every day with limited number of TRF-type sessions,
 - local ties & discontinuities
 - **reference frame specifications** (especially the origin and the scale) when merging the 4 technique normal equations together.



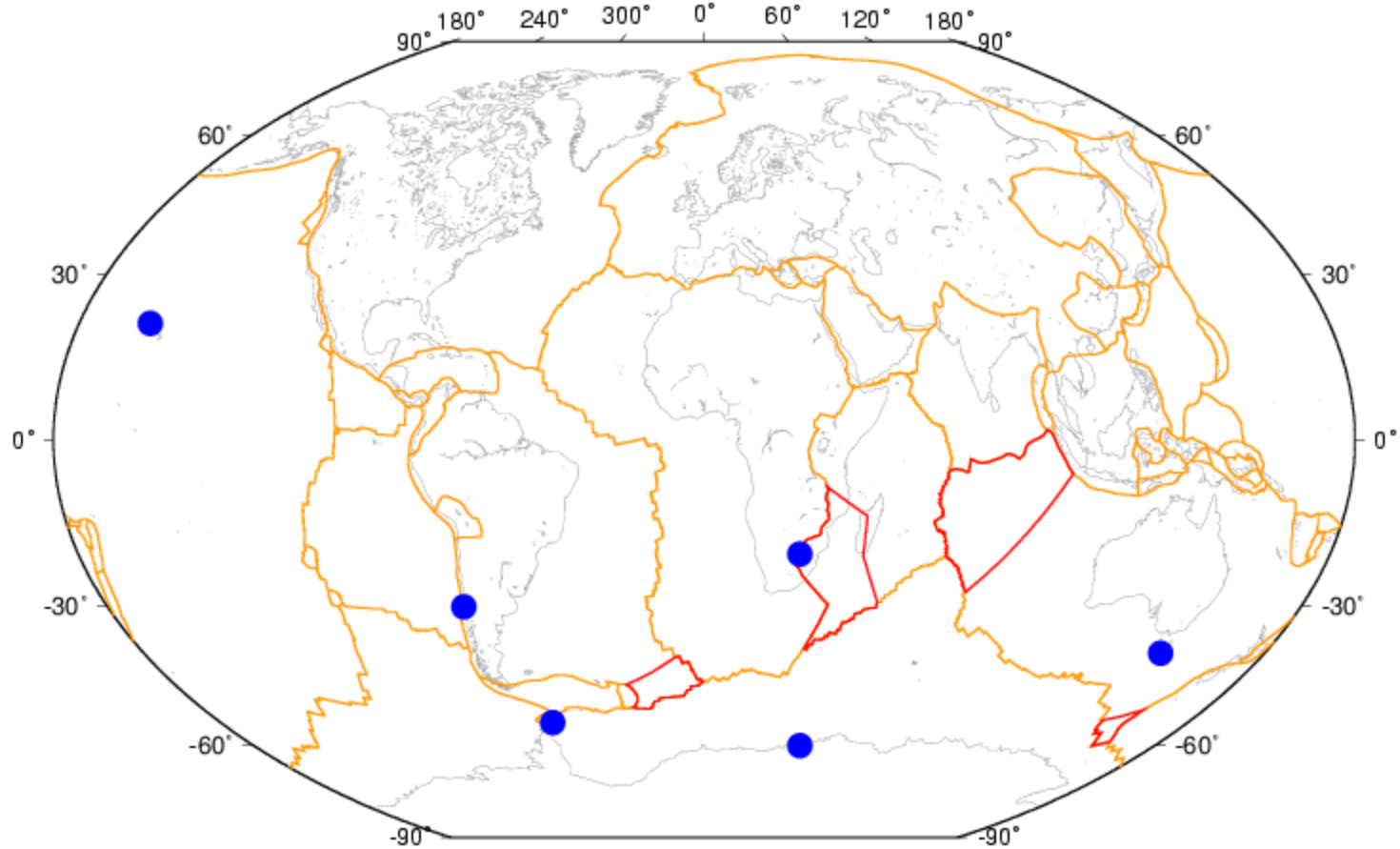
Theme 3: Combination at the observation level (COL) (2/2)

- **What is the current progress made within the COL WG?**
- **Expectation of future availability of routine COL products?**
- **When this will happen?**

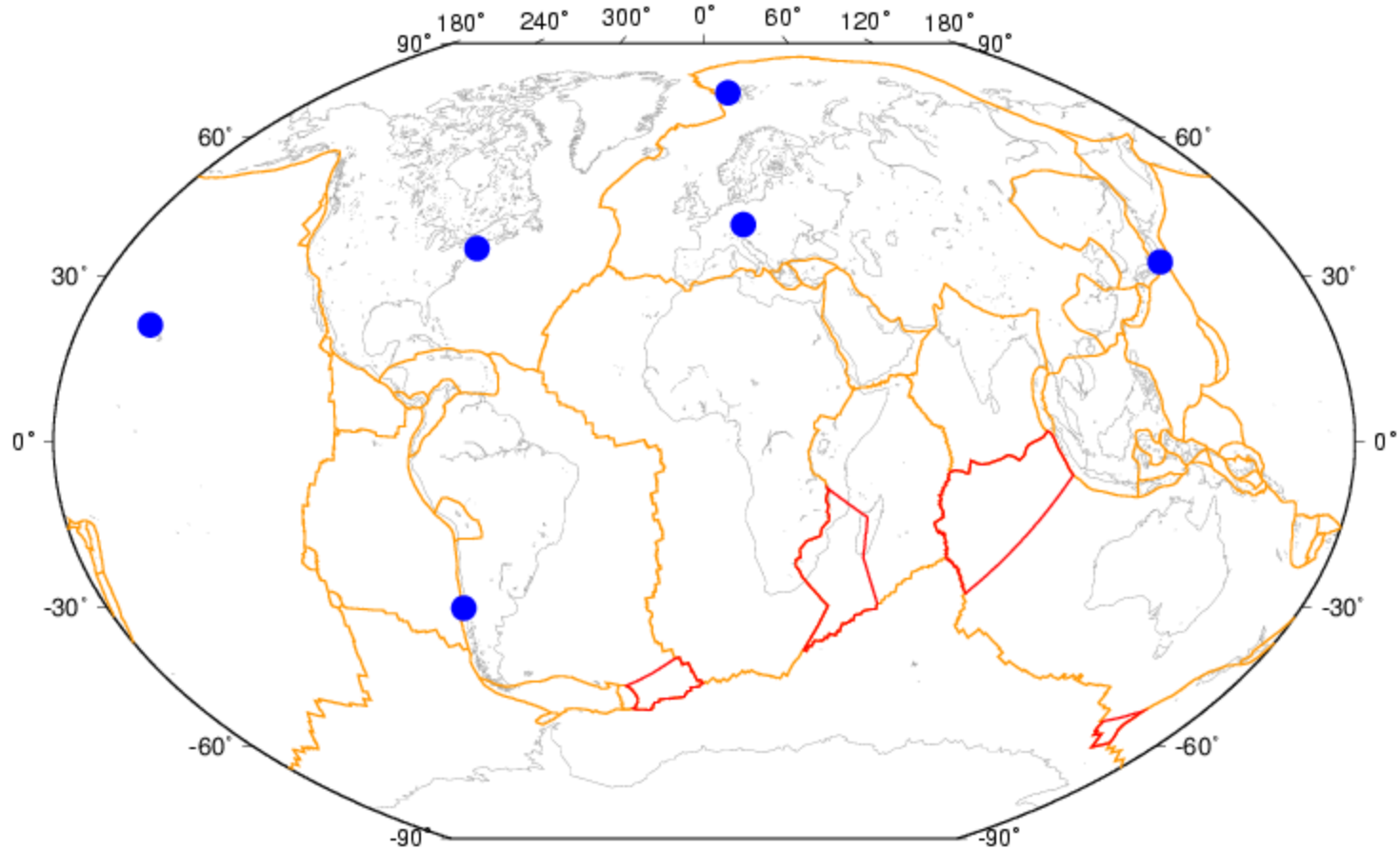
VLBI session February 01, 2011



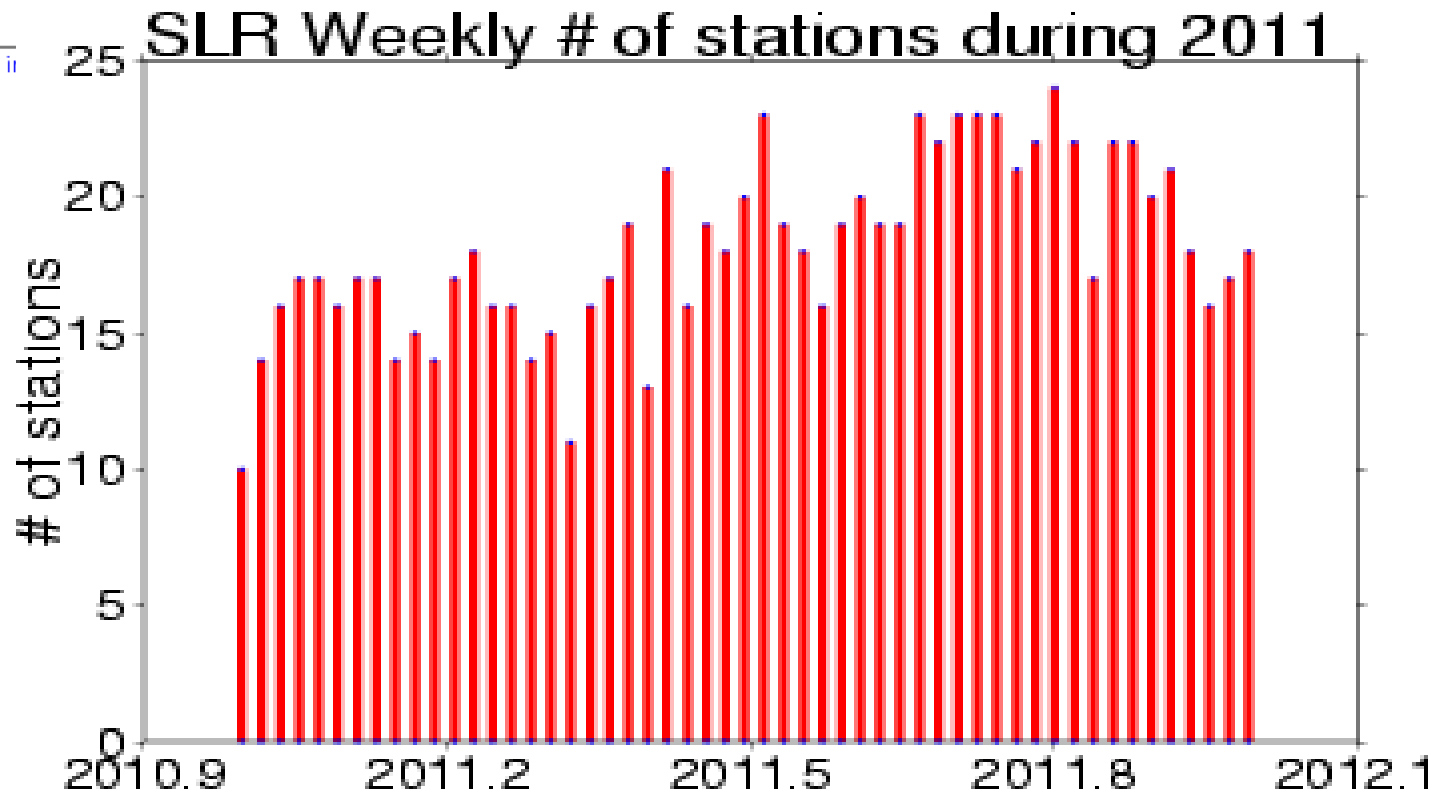
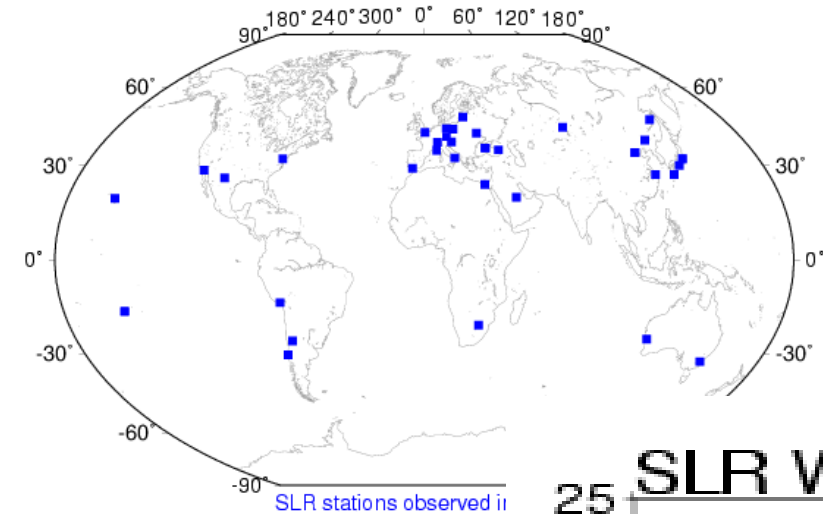
VLBI session February 02, 2011



VLBI session February 07, 2011



SLR



Ties & their measurement epochs

Epochs	GNSS-VLBI	GNSS-SLR	GNSS-DORIS
Up to 2000	14	9	7
2000 to 2005	16	9	24
2005 to now	6 (+2)	5	10
# of GNSS			
Discontinuities	164	140	110

50% of the ties after 2005 are not valid anymore