

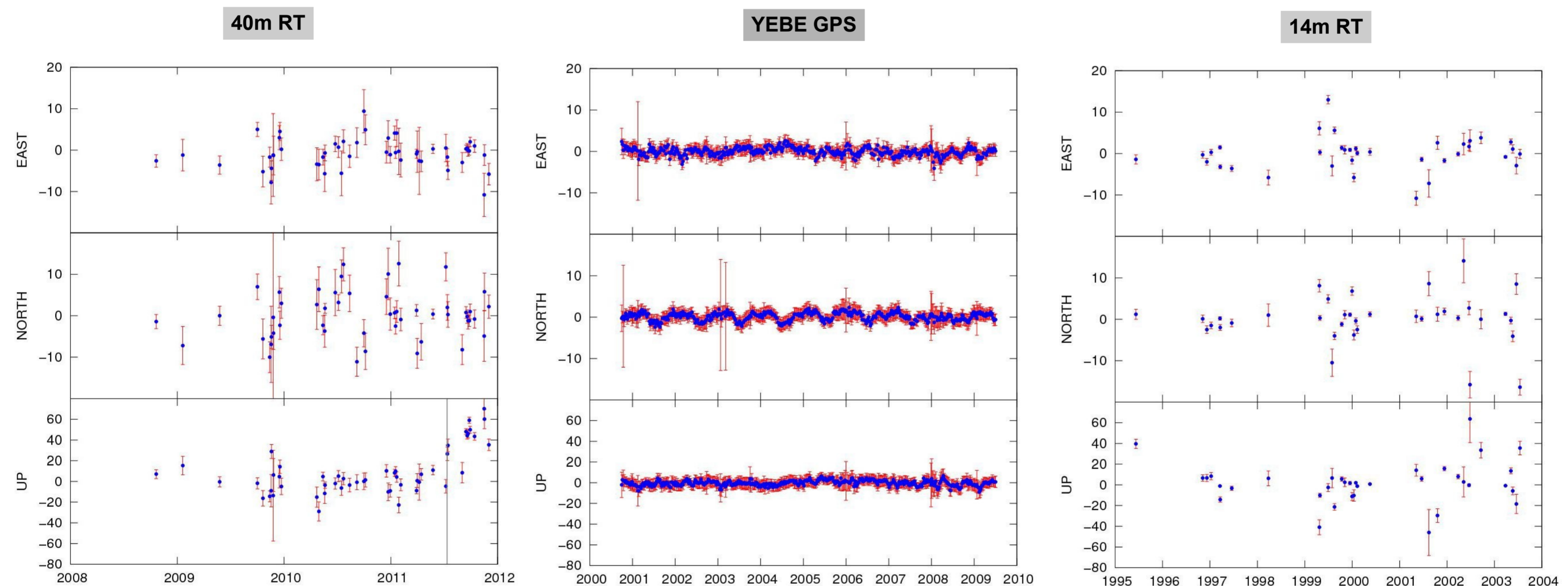
Tying VLBI and GPS terrestrial frames: case study at Yebes Observatory

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The combination of the TRF of each technique allows the best ITRF realization possible. The geometric 3-dimensional local vector tying the physical reference points of each instrument must be accurately known.

At the Yebes observatory we have estimated the coordinates for the 40m radiotelescope in the ITRF2008 using VLBI daily SINEX files from GSFC Analysis Center. Coordinates for the YEBE GPS station and the 14m radiotelescope were extracted from the ITRF2008. With these data, the local relative vectors between space geodetic instruments have been estimated.



12th July 2011 → Fixed focus (optimum at 45° elevation)

Estimated vertical offset ~ 4.6 cm

Estimated relative vectors (m) in ITRF2008 at epoch 2010.4

	ΔX	ΔY	ΔZ	sig ΔX	sig ΔY	sig ΔZ	sig3D
14m-40m	18.2822	-217.5799	-49.1286	0.0064	0.0025	0.0055	0.0088
40m-YEBE	37.2256	147.8632	-9.1818	0.0023	0.0010	0.0019	0.0031
YEBE-14m	-55.5078	69.7167	58.3104	0.0061	0.0025	0.0054	0.0085

How does the data analysis and the observation setup impact the tying of TRFs?

→ The estimated vertical position of IRP in the ITRF2008 is **shifted by 4.6 cm** after fixing the focus. However its relative position wrt other instruments is not expected to change.

How precisely have we estimated the relative position of these instruments?
 Which is the required precision for the following local-tie survey?

→ As the local-tie surveys represent a key element of the ITRF combination, they should be **more accurate than, or at least as accurate as**, the individual space geodesy TRFs.

