3.6.2 Institut National de l'Information Géographique et Forestière (IGN)

This report summarizes the activities of the IGN combination centre during the year 2010. These activities are mainly related to the ITRF2008 analysis and its final combination.

ITRF2008 data analysis

With interaction and communication with the Combination Centers of the TCs, the IERS IGN Combination Center operated continuous analysis of the individual TC solutions submitted to the ITRF2008. As the ITRF2008 pre-analyses showed some deficiencies in some TC solutions, the Combination Centers of the TCs generated updated solutions which caused a certain delay in the ITRF2008 production process. The first step consists in operating data analysis of each individual technique solution, which allowed evaluating the individual station behaviour regarding linear and non-linear station motions. Discontinuities in the station position time series are then localised and introduced in the accumulation (rigorously stacking) of the time series. Sites with multiple stations and discontinuities are then constrained to have a unique velocity, except sites where Earthquakes have taken place. This first step is also an efficient tool to evaluate the temporal behaviour of the frame parameters, especially the physical ones: origin and scale. The two ITRS CCs have also operated comparisons between their intra-technique cumulative solutions.

ITRF2008 combination

A preliminary combination test was generated in early 2010, called ITRF2008P and made available to the TCs for evaluation. After the evaluation period, and taking into account comments from the TCs (e.g. discontinuities and velocity constraints for some sites), the final ITRF2008 solution was released in May 2010. As results of the first step of the ITRF2008 combination, Figure 1 illustrates an assessment of the ILRS SLR origin temporal behaviour. This figure shows that the origin components around the three axes are much more scattered between the start of SLR data in 1983 and 1993, compared to the period afterward. This feature is to be related to the use of one satellite (LAGEOS I) data in the first period, whereas the second period makes use of the two LAGEOS satellites data. For comparison with SLR, Figure 2 illustrates the origin components of the IDS DORIS time series where we can see that the Z-translation is the most scattered component.

The assessment of the scale agreement between VLBI and SLR submitted solutions is illustrated by Figure 3. From this figure we can see that the level of agreement between the two solutions is about 1 ppb. The figure also shows the scale of the IDS DORIS solution, which is situated in between VLBI and SLR scales, although it is closer to VLBI than to SLR.

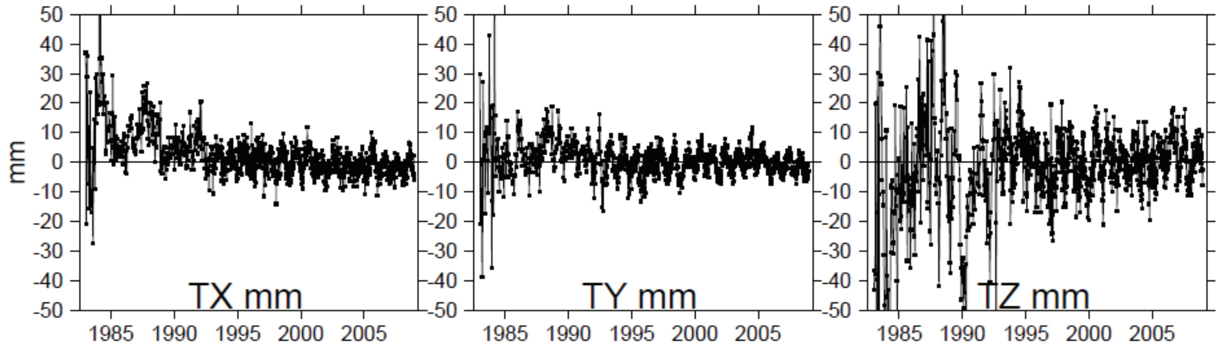

Fig. 1: ILRS SLR origin components with respect to ITRF2008

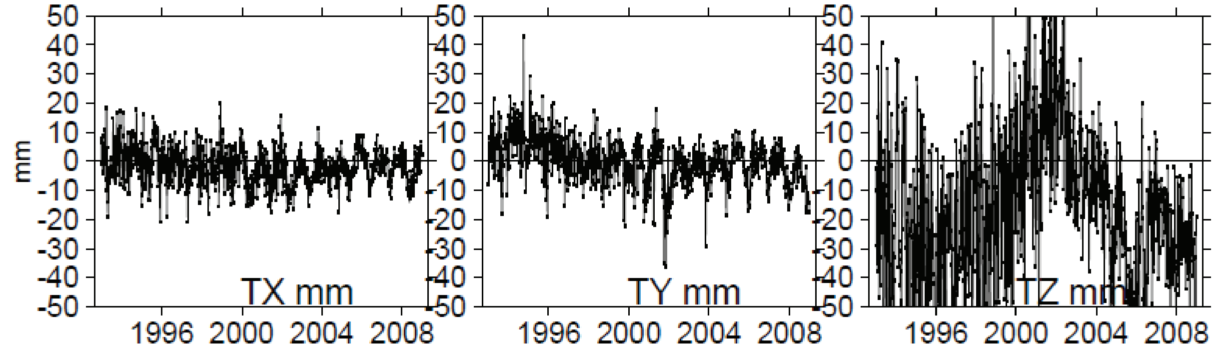

Fig. 2: IDS DORIS origin components with respect to ITRF2008

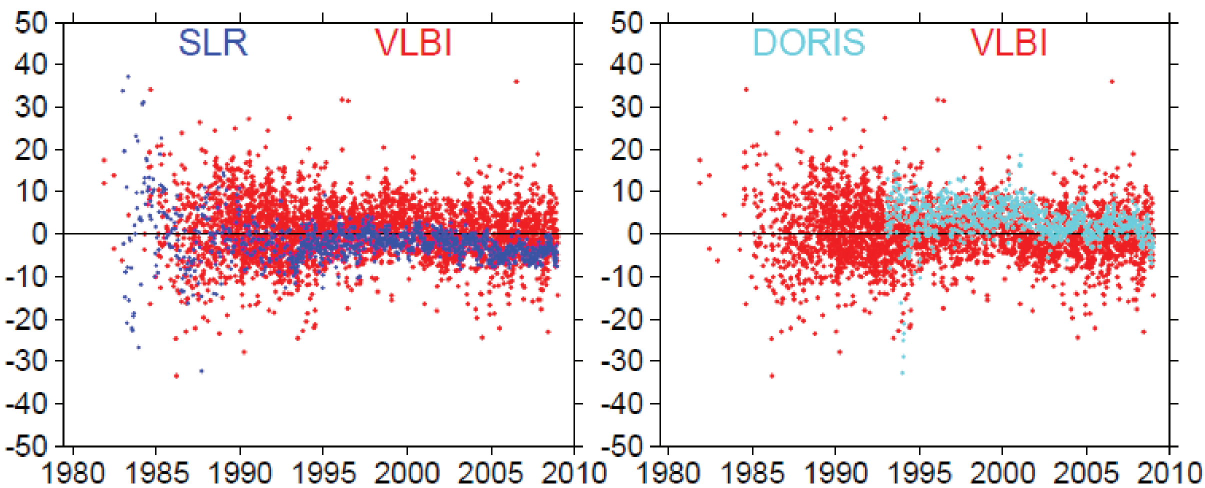

Fig. 3: VLBI, SLR and DORIS scale temporal variations with respect to ITRF2008 in millimetres

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