## 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 2014. These research activities are mainly related to the preparation for the ITRF2014.

### Research and development activities

The members of the IGN CC, often in cooperation with other scientists, conduct research and developments activities relating to the ITRF in particular and reference frames in general. R&D activities include ITRF accuracy evaluation, mean sea level, loading effects, combination strategies, and maintenance and update of CATREF software. Scientific results of specific data analysis and combination are published in peer-reviewed journals, as listed in the references' section, but also presented at international scientific meetings.

### Preparation for ITRF2014

Specific new developments were achieved and validated in preparation for the ITRF2014: CATREF software was enhanced and upgraded to include periodic terms of the station position time series, such as in particular annual, semi-annual terms for all techniques and draconitic signals for satellite techniques, especially GNSS. These new developments are intended to be applied to the technique solutions which were submitted to the ITRF2014.

Other developments were also finalized and validated, such as modelling of post-seismic deformations for sites affected by major Earthquakes, as well as an improved strategy for the detection of discontinuities in the technique station position time series.

First and early results of the ITRF2014 input data analysis were presented at various conferences in 2014.

### Publications

Abbondanza, C, Z. Altamimi, T. M. Chin, R. S. Gross, M. B. Heflin, 2015, Three-Corner Hat for the assessment of the uncertainty of non-linear residuals of space-geodetic time series in the context of terrestrial reference frame analysis, Journal of Geodesy, 89(4), 313–329, doi: 10.1007/s00190-014-0777-x

Métivier, L., X. Collilieux, D. Lercier, Z. Altamimi, and F. Beauducel, 2014, Global coseismic deformations, GNSS time series analysis, and earthquake scaling laws, J. Geophys. Res. Solid Earth, 119(12), 9095–9109, doi:10.1002/2014JB011280.

Rebischung, P., Z. Altamimi and T. Springer, 2014, A collinearity diagnosis of the GNSS geocenter determination, Journal of Geodesy, 88(1), 65–85, doi:10.1007/s00190-013-0669-5

Wu, X., C. Abbondanza, Z. Altamimi, T. M. Chin, X. Collilieux, R. S. Gross, M. B. Heflin, Y. Jiang, and J. W. Parker, 2015, KALREF—A Kalman filter and time series approach to the International Terrestrial Reference Frame realization, J. Geophys. Res. Solid Earth, 120(5), 3775–3802, doi:10.1002/2014JB011622.

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