

ITRF and Geodetic Reference Frames in Africa

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SUMMARY

The establishment and adoption of a global terrestrial reference frame in line with the new technologies used in positioning for various needs has materialized with the realization of the International Terrestrial Reference Frame (ITRF). The many stations (VLBI, SLR, GNSS and DORIS) that define this geodetic terrestrial reference frame are spread over the entire globe. To this end, with the many data collected continuously and the computing and analysis centers involved, they make it possible to provide quality products and solutions for both professionals and researchers in different fields (geodesy, geodynamics, geophysics, meteorology, etc.). This situation makes the ITRF the global geodetic reference frame that must be covered and serve as a basis for the various regional and national geodetic benchmarks in order to arrive at a global, homogeneous, precise, reliable and accessible geodetic frame for all the applications made of it.

This study thus aims to show the situation of the ITRF on the African continent with the distribution of the various stations that compose it and to map the attachment of the Datums in force in relation to the ITRF.

It has, for this purpose, been noted that the alignment with the ITRF of the geodetic reference systems in Africa still remains to be improved if one refers to this noted heterogeneity of the geodetic reference systems in force in the African countries, to the delay in the concretization from the only continental initiative for the implementation of a regional terrestrial reference system of the EUREF, NAD83 or SIRGAS type and to the still rather limited and disparate densification of the stations of the International GNSS Service (IGS). The possibilities of using the ITRF in Africa, like in other regions of the world, remain relatively limited for this purpose. An even more correct densification of the ITRF would make it possible to further improve the quality of certain products in Africa, such as the tropospheric models useful for the PPP, especially the PPP-RT, the velocity

models which would better integrate the intra-plate movements and a ease of adopting a common frame of reference in cross-border projects.

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