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African Geodetic Reference Frame and First Results from GNSS Networks in Africa

The African Geodetic Reference Frame (AFREF) is conceived as a unified geodetic reference frame for Africa. It will be the fundamental basis for the national three-dimensional reference networks fully consistent with ITRF. When fully implemented, its backbone will consist of a network of continuous, permanent GPS stations such that a user anywhere in Africa would have free access to such stations. Full implementation will include a unified vertical datum and support for efforts to establish a precise African geoid. AFREF has vast potentials for geodynamics, geodesy, mapping, surveying, geoinformation, earthquakes, natural hazards mitigation, earth sciences, etc. AFREF is, therefore, an African initiative to unify the geodetic reference frames of Africa based on the ITRF through a network of GNSS base stations at a spacing within ~1000 km between station. First Reference Frame Solution of about 80 GPS stations has been started in February 2014 at some processing centers in Europe and Africa. Results of independent solutions by various African scientific teams: Hart RAO, South Africa, Ardhi University, Tanzania and SEGAL, University of Beria Interior, Portugal, show an accuracy of aligned ITRF 2008 using 42 IGS stations in E and N components with 3.0 mm and in U component 7.5 mm.

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