



Determination of recent horizontal crustal movements and deformations of African and Eurasian plates in western Mediterranean region using geodetic-GPS computations extended to 2006 (from 1997) related to NAFREF and AFREF frames.

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Determination of recent horizontal crustal movements and deformations of African and Eurasian plates in western Mediterranean region using geodetic-GPS computations extended to 2006 (from 1997) related to NAFREF and AFREF frames.

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This study focus on the use of the geodetic spatial technique GPS for geodynamic purposes generally in the Western Mediterranean area and particularly in Morocco. It aims to exploit this technique first to determine the geodetic coordinates on some western Mediterranean sites. And also this technique is used to detect and to determine movements cross the boundary line between the two African and Eurasian crustal plates on some well chosen GPS-Geodynamics sites. It will allow us also to estimate crustal dynamic parameters of tension that results. These parameters are linked to deformations of terrestrial crust in the region. They are also associated with tectonic constraints of the study area.

The usefulness of repeated measurements of these elements, the estimate of displacements and the determination of their temporal rates is indisputable. Indeed, sismo-tectonique studies allow a good knowledge of the of earthquake processes, their frequency their amplitude and even of their prediction in the world in general and in Moroccan area especially. They allow also contributing to guarantee more security for all most important management projects, as projects of building great works (dams, bridges, nuclear centrals). And also as preliminary study, for the most important joint-project between Europe and Africa through the Strait of Gibraltar.

For our application, 23 GPS monitoring stations under the ITRF2000 reference frame are chosen in Eurasian and African plates. The sites are located around the Western Mediterranean and especially on Morocco. Exploiting parameters of positions and dispersions of these stations within the 1997-2003 period, the motion and the interaction types of interaction between African and Eurasian tectonic plates can be estimated. Similarly, the crustal dynamic parameters of tension of these sites will be computed.

The time occupation on repeated observations sites is at least 72 hours. The measurements are continuous on permanent stations. The precise ephemerides are used in GPS computations. The post-treatments are done using commercial and scientific softwares. The coordinates obtained for two consecutive periods t_0 and t_1 within a period of 8 years will be used by programs established for this purpose to estimate crustal dynamic parameters of tension as well as to evaluate the appropriate movements.

Even crustal dynamic parameters will be determined on each sites of the GPS-Geodynamics network, whose interest of seismic investigations is very important. This will allow best knowledge of substantial seismic activities of the surrounding zones. It can be deduced by measuring the motions and their parameter tensions using GPS. These estimations will contribute on the earthquake prediction by supervising the strain accumulation and its release in the active areas.

For the geodetically aspect the GPS-Geodynamics sites computed in the ITRF frame can be used with other similar ounces' of Africa country and some well selected and convenient IGS, EUREF stations..to determine first the NAFREF and the AFRER frames.
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