Scrutiny about changes of coordinates and time series of 5 permanent GPS stations in Iran with changing International Terrestrial Reference Frame 2000 into International Terrestrial Reference Frame 2005 in GAMIT_GLOBK software

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The Earth is not static in nature. The Earth moves, rotates and undergoes deformation. Since motion and position are not absolute concepts, they can be mathematically described only with respect to some reference of coordinates called a reference frame. The purpose of a reference frame is to provide the means to materialize a reference system. International Terrestrial Reference System has an origin at the mass center of the whole Earth including the oceans and the atmosphere into account. The ITRS is realized by estimates of the coordinates and velocities of a set of observing stations of the IERS.

As we know GPS observations are given in special reference system. This system was ITRF2000 until November of 2006, when the International GNSS Service (GNSS) decided to replace it by ITRF 2005. All products of the International GNSS Service (GNSS) depend directly on the underlying reference frame adopted. The numerical values of observed quantities are meaningful only within a well-specified frame.

We want to investigate the effect of this coordinate system change in obtaining GPS precise computation. We implied observation of 5 GPS permanent stations, and then processed observation one time in ITRF2000 and another time in ITRF2005 by using professional software of process of GPS data GAMIT_GLOBK, We obtained the coordinates and time series related to each processing. Finally, we compared these results together to investigate the influence on the results.

Key words: International Terrestrial Reference System, GPS observation processing, transformation parameters between ITRF2000 and ITRF2005, GAMIT_GLOBK software