AvH8-85
8th Alexander von Humboldt International Conference
Cusco, Peru, 12 – 16 November 2012

Necessity of maintaining the regional reference frame from GNSS stations for global change studies

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The reference system is quite necessary for measuring any physical phenomenon that occurs and affects the Earth system, especially if the measuring tools used proceed from the satellite geodetics. They allow relating the variables through different techniques and in such a way it is possible to jointly understand the behavior of the geodynamic phenomena of the Earth system.

The materialization of reference system has done from knowledge of the coordinates of a set of points on the surface. Taking into account that the surface of the earth is in constant motion and in turn is affected by earthquakes that produce large shifts, it is necessary to perform the periodic maintenance of reference frame that materializes a particular system. This makes it possible to know the precise coordinates of the points at the observation time although the displacements produced.

The densification of the international reference system is carried out almost exclusively through GNSS measuring stations. The GNSS stations allow the materialization of the reference frame providing good observations that permit obtaining the needed and required results and precisions for the searched object. In turn the observations collected by GNSS stations are affected by weather events such as the troposphere, which produces a delay in the signal must be estimated and mitigated.

This paper describes the way in which the international reference system is maintained in South America through the operation of local processing centers and the possibilities that GNSS technology provides for the study of water vapor.