Abstract Details

Corresponding Author : Prof. Suriya Tatevian (statev@inasan.ru)

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Title: Comparison of Geocenter Variations Derived from 10 years of GPS and DORIS Data.

Abstract:

Time series of geocenter variations with respect to the ITRF00 have been obtained from two sources: the solutions from DORIS and GPS data for the same ten-year period of time. Data analysis was performed with the GIPSY/OASIS2 software. Daily solutions of coordinates of the IGS core stations and about of 50 DORIS stations are combined into weekly solutions and transformed to a well defined ITRF2000 with the use of 7 parameters of Helmert transformation. Three estimated translations parameters and scale factor provide information on variations of geocenter positions. The two time series (for GPS and DORIS data) have been analysed separately and compared. The harmonic and regression analyses have been applied in order to estimate a constant term, linear trend, semi-annual and annual amplitudes and phases. Additionally to the annual and semiannual signals with amplitudes 4.1-11.5 mm, several other, more shorter periods (a fortnight and of one to four months) were found in both time series. It must be noted that the amplitudes of some short-periodic signals are comparable with the amplitudes of semiannual signals. Besides, the secular trend of the geocenter motion with a velocity of a few mm per year was found. An investigation of the periodicity of observed time series of geocenter motion is important for improvement of geophysical models and for establishing a more accurate ITRF system.

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Co-Authors

No.	Title	First Name	Family Name	Organization