

Precision of GPS point positioning -part5- Influence due to polar motion

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<http://home.att.ne.jp/iota/bluedoor2001/index33.html>

My previous study, on the basis of GPS survey in Odawara-city from 2002 to 2004, has suggested GPS point positioning data have one-day cycle, one-month cycle, and a seasonal variation, that may be due to atmospheric tide and atmospheric pollutions mainly.

However it is imaginable that polar motion effects GPS point positioning, it has been excluded in my data analysis before.

In this report, at first on the assumption that GPS is not corrected on polar motion, I have calculated in latitude, longitude and ellipsoidal height the motion of the survey point of Odawara due to the deviation of earth pole from IRP (mean of North Pole) which is published as Bulletin A and Bulletin B by IERS (International Earth Rotation Service).

Analysis of differences between these theoretical values and GPS data as new GPS data suggests GPS has already been corrected on polar motion, because SD of X coordinates of original GPS data is approx. 3 m, on the other hand that of new GPS data is approx. 8m.

However, IERS publishes two types of data on polar motion i.e. a forecast in Bulletin A and a fixed value in Bulletin B. There is some difference between them (B-A), which is calculated several 10 cm as the motion of the survey point of Odawara.

In this report, I analyze the relation between GPS data and the atmospheric tide and pollutions, involving the difference of B-A.