Uncertainty of Coordinates and Looking for Dispersion of GPS Receiver

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Abstract

The aim of the paper is to show some possible statistical solution of the estimation of the dispersion of the GPS receiver. The presented method (based on theory of linear model with additional constraints of type I) can serve for an improvement of the accuracy of estimators of coordinates acquired from the GPS receiver.

Key words: Two stage regression models; BLUE; uncertainty of the type A and B; confidence ellipsoids; variance components.

2000 Mathematics Subject Classification: 62J05, 62J10, 62F10

1 Introduction

The aim of this paper is to make one keep in view that the geographical coordinates, obtained with the help of a GPS receiver cannot be regarded as accurate data. Based on the results of one exemplary measurement, we will show that it is always necessary to take into account an uncertainty of data acquired from the GPS receiver. The user of the GPS receiver should always consider carefully if the measured values are sufficiently accurate with respect to the particular purposes. This conclusion can be drawn only in cases when an estimation of a dispersion of the GSP receiver is known in a given place and time.