Accuracy Management in GPS Engineering Applications

Dr. Otakar ŠVÁBENSKÝ and Dr. Josef WEIGEL, Czech Republic

Key words: Positioning, GPS, Engineering Geodesy and Accuracy.

ABSTRACT

GPS technology plays an essential role in contemporary engineering surveys. However, the problems of accuracy planning and evaluation are not yet fully solved concerning the precise GPS applications (deformation measurements, long term monitoring of structures). On the other hand, many practical commercial user wants to know simple ways to improve his GPS results.

This contribution presents the more than ten years experience of the authors in this field based on various experimental GPS campaigns and real project surveys. Accuracy factors of static and kinematic GPS methods are described. Problems in confrontation of formal and real accuracy are discussed. The best reduced observation scheme which can substitute the long sessions with minimal loss of accuracy is proposed together with practical results. Accuracy parameters for static surveys in respect of baseline length and observation time are evaluated. Contributions of the permanent GPS stations data and other IGS products are considered.

The accuracy management principles were successfully applied in practice, e.g. in long term geodynamic monitoring of an mountain area, in bridge and railway track deformation surveys. Another example is the improvement of vertical accuracy in GPS re-measurement of a levelling line section for the purposes of quasigeoid investigations and modeling.

CONTACT

Doc. Ing.Otakar Švábenský, CSc. and Doc. Ing. Josef Weigel, CSc.
Brno University of Technology, Department of Geodesy
Veveri 95
662 37 Brno
CZECH REPUBLIC
Tel. + 420 5 41147211
Fax + 420 5 41147218
E-mail: svabensky.o@fce.vutbr.cz , weigel.j@fce.vutbr.cz
Web site: www.fce.vutbr.cz