

Cross-border precise levelling measurements for realization of state levelling network in EVRS

Slaveyko Gospodinov (1), Elena Peneva (1), Tatyana Lambeva (1), and Sasho Dimeski (2)

(1) University of Architecture, Civil Engineering and Geodesy (UACEG), Faculty of Geodesy, Geodesy, Sofia, Bulgaria (peneva_el@yahoo.com), (2) Agency for Real Estate Cadastre, Republic of Macedonia, Skopje (s.dimeski@katastar.gov.mk)

Realized precise levelling measurements for connection of state levelling network of a Balkan region country to the European Vertical Reference System (EVRS) are presented in the paper. Presented measurements and processed data are made upon an international agreement between the cadastral services of the two countries - Agency for Geodesy Cartography and Cadastre of the Republic of Bulgaria and Agency for Real Estate Cadastre of the Republic of Macedonia (Former Yugoslav Republic of Macedonia - FYROM). The levelling connection lines are three in the cross-border area between the two countries. The mean length of each levelling line is about 25 km.

The precise levelling measurements are designed and realized in accordance with the new standard for precise levelling measurements in Bulgaria (in process of implementation). Precise levelling measurements are fulfilling requirements for accuracy of Bulgarian first class levelling network. On the three levelling connection lines are performed gravimetric and precise GNSS measurements. With the obtained results of measurements are calculated geopotential numbers and normal heights for the three fundamental benchmarks of the joined to EVRS state levelling network. The achieved results are presented and discussed. The results are analysed upon derived differences between measured and officially given data from the two cadastral agencies. The difference in height systems is product of their definition and realization.