



STRUVE arc and EUPOS[®] stations

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The Struve Geodetic Arc was developed in Years 1816 to 1855, 200 years ago. Historic information on the points of the Struve Geodetic Arc are included in the UNESCO World Heritage list in 2005. Nevertheless, the sites of many points are still not identified nor included in the data bases nowadays. Originally STRUVE arc consisted of 258 main triangles with 265 triangulation points. Currently 34 of the original station points are identified and included in the in the UNESCO World Heritage list.

identified original measurement points of the Meridian Arc are located in Sweden (7 points), Norway (15), Finland (83), Russia (1), Estonia (22), Latvia (16), Lithuania (18), Belorussia (28), Ukraine (59) and Moldova (27).

In Year 2002 was initiated another large coverage project – European Position Determination System “EUPOS[®]“. Currently there are about 400 continuously operating GNSS (Global Navigation Satellite Systems) stations covering EU countries Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Bulgaria, Romania and East European countries Ukraine and Moldavia. EUPOS[®] network is a ground based GNSS augmentation system widely used for geodesy, land surveying, geophysics and navigation. It gives the opportunity for fast and accurate position determination never available before.

It is an honorable task to use the EUPOS[®] system for research of the Struve triangulation former sites. Projects with Struve arc can popularize geodesy, geo-information and its meaning in nowadays GIS and GNSS systems. Struve Arc and its points is unique cooperation cross-border object which deserve special attention because of their natural beauty and historical value for mankind.

GNSS in geodesy discovers a powerful tool for the verification and validation of the height values of geodetic leveling benchmarks established historically almost 200 years ago.

The differential GNSS and RTK methods appear very useful to identify vertical displacement of landscape by means of inspection deformation of leveling networks within the European framework of ground based GNSS European positioning augmentation system EUPOS[®]. The GNSS observation RTCM corrections produced by the EUPOS[®] system can be used for high precision position determination in various navigation and land surveying applications.

Using EUPOS[®] network together with data from European Combined Geodetic Network (ECGN) and applying Bernese v.5.0 Software it is possible to compare situation of the solid Earth tide caused vertical displacements at the EUPOS[®] (EUREF) stations which are close to Struve arc within region from Artic Ocean till Black Sea.

Scientific staff of LU GGI is looking forward for eventual participation in cooperation and science projects.

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