

Proposal for the EUREF Permanent Network Analysis Coordinator

In response to the EUREF Mail No. 6891 we would like to submit the proposal for the EPN Analysis Coordinator (EPN AC). The responsibilities of the EPN AC will be carried out by the consortium of the Military University of Technology (MUT) in Warsaw as the consortium leader, and the Warsaw University of Technology (WUT). The director of the consortium will be dr. Mariusz Figurski, professor of the MUT, and the responsible scientists will be Ms. Karolina Szafranek and Mr. Andrzej Araszkiewicz from the MUT and Ph.D. Tomasz Liwosz from the WUT. A more detailed description is given below.

The Combination Centre - proposal

Msc Ing. Karolina Szafranek (EPN Analysis Coordinator for the first 2 years)



In 2007 she graduated from Geodesy and Cartography Department of Warsaw University of Technology (specialization "Geodesy and Satellite Navigation") with diploma "Application of the autoregression algorithm for moving objects' track prediction" written under Ph.D. Ryszard Szpunar guidance. In 2008 she started to work at Faculty of Civil Engineering and Geodesy in Military University of Technology. Satellite geodesy, reference frames and geodesy are her main interests. Since the establishment of MUT LAC she takes part in its operation.

Basing on agreement between the Head Office of Geodesy and Cartography (HOGC) and MUT she monitors ASG-EUPOS solutions mainly for the purpose of ETRS'89 realization in Poland. She participated in EPN Reprocessing project. Since 2011 she manages the project financed by National Science Centre "Analysis of differences between sites' coordinates determined using SLR and GPS techniques performed in the frame of Global Geodetic Observing System (GGOS) realization" in cooperation with Space Research Centre of Polish Academy of Science. She is a member of the COST Action ES1206 ("Advanced Global Navigation Satellite Systems tropospheric products for monitoring severe weather events and climate" GNSS4SWEC) Management Committee. The defense of her Ph.D. Thesis ("Estimation of influence of ASG-EUPOS coordinates stability on ETRS'89 realization") is scheduled to take place in May 2013.

Msc Ing. Andrzej Araszkiewicz (EPN Analysis Coordinator the next 2 years)



He graduated from Warsaw University of Technology, Faculty of Geodesy and Cartography with specialization "Satellite Geodesy and Navigation". Was defending a master's degree thesis "On the use of wavelet transform in the analysis of tidal signal" under the guidance of Ph.D. Janusz Bogusz. In 2008, he worked at the Institute of Geodesy and Cartography, where he learned the ins and outs of geodetic science and took part in the magnetic and gravimetric measurements. Since 2009 he is an employee of the Military Technical Academy at the Faculty of Civil Engineering and Geodesy, where he divides work to classes with students and scientific work, which focuses on satellite geodesy, geodynamics and time series analysis. His main

interest is the Earth's crust deformations and their study using GNSS measurements. He participated in EPN Reprocessing project accounting for re-analysis in GAMIT/GLOBK package. In 2011 he began a Ph.D. degree conferment procedure with the Thesis: "Analysis of GPS baseline vectors changes to determine the local velocity field in Europe" under the guidance of Prof. Mariusz Figurski. He takes part in LAC MUT operation.

Ph.D. Mariusz Figurski



He is a graduate of Faculty of Electromechanics at MUT (1989). He received Ph.D. degree in engineering in 1995 and Military University of Technology Professor in 2005. Since 1990 he has worked in Faculty of Civil Engineering and Geodesy. He is the author of many papers concerning satellite geodesy, geodesy, meteorology and geodynamics. Currently he is a Vice-rector of Military University of Technology. In his research he concentrates on geodetic and geodynamic applications, as well as on GNSS processing. He was responsible for establishing geodetic networks (WSSG, POLREF, EUREF-POL, EUVN) using GPS technique. He is a member of IGS Ionosphere Working Group. In 2009 he began routine processing for the EPN as MUT LAC. In 2007 he was appointed a Vice-chairman of Satellite Geodesy Commission of Space and Satellite Research Committee of Polish Academy of Sciences (PAS). He is also a member of Geodynamic and geodetic network section of PAS Geodetic Committee. Between 2007-2008 he was an expert for ASG-EUPOS group. For his scientific achievements he was awarded a Silver Cross of Merit by Polish President in 2007.

Ph.D. Tomasz Liwosz



He works in the Department of Geodesy and Geodetic Astronomy, Faculty of Geodesy and Cartography at the Warsaw University of Technology (WUT). He received a Ph.D. degree in a field of satellite geodesy from WUT in 2005. He deals with the processing of the GPS data in a regional networks since 2000. In the years 2001-2008 he made WUT's solutions of the GPS regional network within the Central European Research on Geodynamics Project (CERGOP). In 2011, he was responsible for the project concerning the data processing of Polish national GNSS reference network and the definition of a new ETRS89 realization for Poland; the project was conducted at WUT for the Polish Head Office for Geodesy and Cartography. He mainly uses Bernese GPS Software for GNSS data analysis, combination, and stacking. In 2012 he took part in the CATREF software training course at IGN. Since the end of 2009 he is responsible for activities of the WUT EPN LAC.

Msc Ing. Grzegorz Nykiel - GNSS software developer

Ing. Piotr Szymański - IT specialist

Experiences and resources

The Combination Centre responsibilities will be carried out by the Military University of Technology and the Warsaw University of Technology.

Military University of Technology (MUT) educates and trains Polish military personnel since 1951. In 1997 first civilian students joined MUT, which currently is a state, technical university, with 1st, 2nd and 3rd degree of studies conducted in 14 specializations (among others geodesy and cartography). MUT conducts research, implementation and modernization of technical, chemical, physical, economic and military sciences. The high level of scientific research is confirmed by numerous prestigious national and international awards.

MUT LAC since December 2009. The GNSS data from 117 EPN stations distributed evenly in Europe are processed in the Centre starting from 1558 GPS week. For routine operations MUT LAC uses Bernese 5.0 software (in the near future upgrade to 5.2 version is planned). Besides, it performs analysis using GAMIT/GLOBK 10.4, NAPEOS and CATREF software. The Centre participated in EPN Re-processing project and performed parallel re-analysis of the whole EPN network in both used software's (Bernese and GAMIT/GLOBK). Basing on agreement with the Head Office of Geodesy and Cartography MUT processes data from Polish national GBAS system called ASG-EUPOS, monitors coordinates of its stations and determines its velocities. Similar control is performed for permanent GNSS sites managed by private companies (VRSNET.PL, SmartNet and TPI NETpro).

Warsaw University of Technology is a research intense, doctoral level academic institution focused on undergraduate and graduate programs in engineering and applied sciences. With over thirty thousand students served by over two thousand professors and instructors, Warsaw University of Technology is the largest and the highest ranking engineering university in Poland.

Warsaw University of Technology has been operating the WUT EPN LAC since 1996. WUT LAC contributes to EPN with final and rapid products of the GNSS EPN subnetwork. Since 2010 WUT participates in the EPN Reprocessing project and until now has reprocessed data collected between 1996-2006 of the EPN subnetwork. In 2011 WUT analyzed data of Polish GNSS reference network and created a new realization of ETRS89 for Poland, which has been accepted by Polish Head Office for Geodesy and Cartography. The following software for combination is available at WUT: Bernese GNSS Software, CATREF.

MUT's Rector-Commandant guarantees financial support for Combination Centre activities for the next 4 years. The official statement is attached to this proposal.