2Challenge 5 „Climate actions, environment, resource efficiency and raw materials"
HORIZON 2020 (8th Framework Programme EU)
Offer for the participation in the project that will be prepared for the 2nd call for proposals

The institution	**Name**: Institute of Geodesy and Geoinformatics
	Address: 50-357 Wrocław ul. Grunwaldzka 53
	Represented by: name: Prof. Jarosław Bosy e-mail: jaroslaw.bosy@igig.up.wroc.pl tel: 71 3205688

Is interested in the participation in a project that will be prepared and submitted in the following topic:

Number of the open topic and Title (from Work Programme)	**SC5-15-2015; SC5-18-2014/2015** **EARTH OBSERVATION-2015-LEIT SPACE** **H2020-EO-2015**

Short description of the organisation:

The research portfolio of the **Institute of Geodesy and Geoinformatics (IGG)** is organised around one fundamental objective:

„Research conducted at IGG should excel in monitoring of environmental and anthropogenic phenomena with the use of satellite, geodetic and photogrammetric techniques as well as cartography and geographic information systems''.

The IGG between 1999 and 2013 successfully run **50 externally funded** (national, international and private) research projects, advancing research frontiers in: landslide remote monitoring using InSAR – LIDAR, erosion remote sensing LIDAR data filetering, near real-time GNSS based 3D monitoring of the troposphere, GNSS precise positioning, integration and verification of metadata and semantic Web for search, geoinformatics data standardisation, local and regional geodynamics, open-source geoinformatics software development, cartographic modelling and others.

GNSS&Meteo (http://www.igig.up.wroc.pl/igg/) is an active working group, in the first stage of the research was focused on the use of ZTDs from GNSS observations to reconstruct tomographic model of the most variable part of troposphere - water vapour. The most recent investigations are associated with the Near Real Time models of water vapour NRT 4DWVD and meteorological parameters: temperature and pressure NRT 4DTPD in atmosphere for geodetic and meteorological applications.

Group's contribution to the E-GVAP program is fully automated and autonomic; Bernese 5.2 based troposphere near real-time GNSS data processing engine, working as a continuous service. This service is complemented with integrated meteorological ground based model that delivers consistent troposphere conditions anywhere, anytime.

The list of group's GNSS meteorology scientific papers covers 20 publication including 8 in ISI Journals. Currently two members are Chairs of International Association of Geodesy Working Groups pursuing research in tomography models development and integration of GNSS atmosphere models with NWP models.

Proposed contribution to the project:

WUELS IGG GNSS&Meteo is able to deliver high quality autonomous, multi-GNSS, real-time positioning using its unique capabilities to precisely model troposphere, ionosphere, orbits and clocks. Decimeter level accuracy is expected using PPP solutions proposed by GNSS&Meteo.

WUELS IGG GNSS&Meteo through its unique capabilities can provide 4D troposphere models as a data source for nowcasting and weather forecasting services.

Chosen references (publications, others):

Hadaś T., Bosy J. *IGS RTS precise orbits and clocks verification and quality degradation over time* GPS Solutions, Vol. Published online No. , Berlin Heidelberg 2014, pp. 1-13

Norman R. J., Le Marshall J., Rohm W., Carter B. A., Kirchengast G., Alexander S., Liu C., Zhang K. *Simulating the Impact of Refractive Transverse Gradients Resulting From a Severe Troposphere Weather Event on GPS Signal Propagation* IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS), Vol. PP No. 99, 2014, pp. 1-7

Rohm W., Yang Y., Biadeglgne B., Zhang K., Le Marshall J. *Ground-based GNSS ZTD/IWV estimation system for numerical weather prediction in challenging weather conditions* Atmospheric Research, Vol. 138 No. , 2014, pp. 414-426

Rohm W., Zhang K., Bosy, J. L*imited constraint, robust Kalman filtering for GNSS troposphere tomography* Atmospheric Measurement Techniques, Vol. 7 No. 5, 2014, pp. 1475-1486

Yuan Y., Zhang K., Rohm W., Choy S., Norman R., Wang C.-S. *Real-time retrieval of precipitable water vapor from GPS precise point positioning* Journal of Geophysical Research: Atmospheres, Vol. 119 No. 16, Wiley 2014, pp. 10044-10057

Hadaś T., Kapłon J., Bosy J., Sierny J., K Wilgan *Near-real-time regional troposphere models for the GNSS precise point positioning technique* Measurement Science and Technology, Vol. 24 No. 5, 2013, pp. 055003 (12 pp.)

Rohm W. *The ground GNSS tomography - unconstrained approach* Advances in Space Research, Vol. 51 No. 3, 2013, pp. 501-513

Bosy J., Kapłon J., Rohm W., Sierny J., Hadaś T. *Near real-time estimation of water vapour in the troposphere using ground GNSS and the meteorological data* Annales Geophysicae, Vol. 30 No. , Göttingen, Germany 2012, pp. 1379-1391

Rohm W. *The precision of humidity in GNSS tomography* Atmospheric Research, Vol. 107 No. , 2012, pp. 69-75

Rohm W., Bosy J. *The verification of GNSS tropospheric tomography model in a mountainous area* Advances in Space Research, Vol. 47 No. 10, 2011, pp. 1721-1730

Bosy J., Rohm W., Borkowski A., Figurski M., Kroszczyński K. *Integration and verification of meteorological observations and NWP model data for the local GNSS tomography* Atmospheric Research, Vol. 96 No. , 2010, pp. 522-530

Bosy J., Rohm W., Sierny J. *The concept of Near Real Time atmosphere model based of GNSS and meteorological data from ASG-EUPOS reference stations* Acta Geodynamica et Geomaterialia, Vol. 7 No. 3 (159), Prague, Czech Republic 2010, pp. 253-261

Other information (if relevant): ----------------