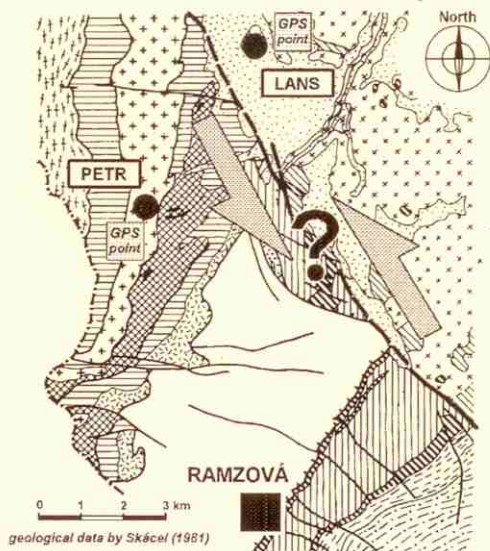


Czech - Polish Workshop
ON RECENT GEODYNAMICS
OF THE EAST SUDETEN AND ADJACENT AREAS

PROGRAM and ABSTRACTS



Ramzová, Czech Republic
5th – 7th November, 1998

P R O G R A M

Thursday - November 5, 1998

1. Opening of the Workshop (Ceremony)

14:00 – 14:25

Address of the Director of the Institute of Rock Structure and Mechanics, the Academy of Sciences of the Czech Republic

Address of the representative person of the Polish collaborators

Address of the Municipality Office chair-person of the Jeseník district

2. Geodynamics of the Sudeten and Its Adjacent Areas

Chair: **Stefan Cacoň**

14:30 – 16:30

V. Schenk, Z. Schenková, P. Kottnauer: Geodynamic Model of the Bohemian Massif and Its Relation to the Mobility of Sudetic Structures

J. Skácel: Vertikální pohyby podél hlavních zlomů východopsudetské oblasti. (Vertical Movements along Main Faults of the East Sudetic Area)

R. Grygar: Kinematic History and Role of the Sudetic's Tectonic Zones

O. Jamroz: The Investigations of the Upper Layer of Lithosphere Deformation in Polish Part of the Śnieżnik Massif – Results from term 1992 – 1997

Coffee break

3. Seismicity Pattern of the Sudeten and Earthquake Monitoring

Chair: **Vladimír Schenk**

17:00 – 19:00

Z. Schenková, B. Guterch: Seismicity of the Sudeten area – The Direct Evidence on Existence of the Recent Mobility of the Area

Z. Skácelová: Earthquakes in the North-Eastern Part of the Bohemian Massif Recorded by the IPE Stations

Z. Kaláb, J. Knejzlík: Present Day Earthquake Activity of the Moravo-Silesian Region: Registration by the HRMC, ŽLHC and ZARC Seismic Stations

A. F. Idziak, J. Hollek - Idziak: Strong Seismic Events in the Upper Silesian Coal Basin

M. Brož: Long Term Monitoring of Local Seismic Events to Determine Optimum Parameters of Local Seismic Stations - A Case of the Ostaš Site (Broumov Area)

Informal "Get-Together" dinner

3. Gravity Field

Chair: **Witold Zuchiewicz**

9:00-10:00

J. Švancara, F. Hubatka, O. Krejčí: Balanced Density Model of Geological Structure Along the Profile Potštát-Lidečko across the Carpathian Flysch Belt

M. Barlik, S. Cacoň: Gravity Changes Observed in Polish Part of East Sudeten and Sudetic Foreland in Period 1992-1998

Coffee break

4. GPS Monitoring and Data Processing

Chair: **Josef Weigel**

10:30-12:30

V. Schenk, P. Kottnauer, Z. Schenková: GPS Network "SUDETEN" and Its Relation to the Other GPS Networks in the Sudeten area

J. Bosy, B. Kontny: Local Geodynamic GPS Networks: "GEOSUD" and "SILESIA" – Strategy of Observation Data Processing and First Results

O. Švábenský: Overview and Evaluation of Experimental Measurements in Czech Part of the Local Geodynamic Network "SNĚŽNÍK"

W. Góral: Influence of the Differential Refraction Correction in GPS Measurements on Accuracy of Coordinate Determination

Lunch

5. Neotectonics and Related Subjects

Chair: **Radomír Grygar**

14:00-16:30

S. Cacoň, S. Dyjor: Neotectonic and Recent Movements of the Earth Crust in Polish Part of the Sudeten and the Sudetic Foreland

J. Havíř: Earthquakes on the Eastern Margin of the Bohemian Massif in Relation to Another Evidence of Recent Tectonic Activity

V. Schenk, L. Pospíšil, Z. Schenková: Remote Sensing Data and Neotectonic activity in the Sudeten Area

W. Zuchiewicz: Neotectonics of the Polish Carpathians from Geomorphological Point of View

J. Krásný: Hydrogeological Data as Indicator of Neotectonic Activity

B. Košťák, S. Cacoň: Applying a Multilevel System for Field Mass Movement Monitoring in Sudety Region

Coffee break

13. Recent Environmental Programs in the Sudeten Area

Chairs: Stanisław Dyjor, Jan Švancara, Zdeněk Kaláb and Adam Idziak

17:00-18:30

Discussion Themes: Water reservoirs (Otmuchów, Nysa, Kozielno, Topola, Kamieniec Ząbkowicki, Slezská Harta, Kružberk and Dlouhé Stráně) and mining activity (Turów, Lower- and Upper-Silesian mining districts), effects of induced geodynamic events, geomorphology and floods

Dinner

Saturday – November 7, 1998

14. Future Geodynamic Projects Proposed for Multi-Parametric Investigation of the Sudeten Area

Chairs: Stefan Cacoň and Vladimír Schenk

9:00-12:00

Discussion Themes: Presentation of recent results (for the EGRSE journal)– within given topic circles and/or with respect to individual groups of authors. Establishment of related GPS campaigns for the future geodynamic investigations, their hierarchy and goals. Conception of possible joint Project(s) and their financial covering (national, bilateral and/or EC grants). How to link the recent GPS activity to other geo-scientific activities. Proposals for future collaborations and fixing the necessary terms – a deadline for accepting the papers for publishing, deadlines for individual grant applications, etc.

Lunch

15. Excursion to the Main (Central) Sudeten Fault Zone near Žulová, where its expected recent mobility is monitored by two GPS points LANS and PETR 13:30-16:30

The excursion can be organised only by cars of individual participants and its realisation also depends on local weather conditions.

GRAVITY CHANGES OBSERVED IN POLISH PART OF EAST SUDETEN AND SUDETTIC FORELAND IN PERIOD 1992-1998

M. Barlik¹, S. Cacoń²

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² Department of Geodesy and Photogrammetry,
Agricultural University of Wrocław

In East Sudeten, in Kłodzki Śnieżnik Massif and in Sudeten Foreland, since 1992, during five cycles, there have been performed observations of gravity differences between installed geodynamical stations. Using precise LaCoste & Romberg (Model G and D) and Scintrex CG-3 Autograv gravimeters the temporal variations of gravity have been monitored in reference to some pointed out station outside investigated tectonic structures. The reference level for our investigations is supported by a gravity on fundamental station at Józefosław Observatory, near Warsaw, where the absolute gravity by ballistic gravimeter has been determined and on gravity point at Academy of Agriculture in Wrocław, which is connected with permanent GPS station. In Śnieżnik Massif, there were pointed out a clear tendency of gravity arising on points situated in lower parts of geodynamic test field and decreasing of gravity in upper parts. The most interesting situation, taking into account the temporal gravity changes in Sudetic Foreland, in Paczków Graben has appeared. Our investigations pointed out the gravity decreasing to the East from Nysa and, antisymmetrically, the gravity increasing on the western part of this complex.

**LOCAL GEODYNAMIC GPS NETWORKS:
„GEOSUD” AND „SILESIA”
– STRATEGY OF OBSERVATION DATA PROCESSING
AND FIRST RESULTS**

J. Bosy, B. Kontny

Department of Geodesy and Photogrammetry
Agriculture University of Wrocław

The local geodynamic GPS networks: GEOSUD and SILESIA cover the area Middle- and East Sudety Mts. and Sudety Foreland. The network GEOSUD was established by Department of Geodesy and Photogrammetry of Agriculture University of Wrocław (Poland) in 1996. The network SILESIA was designed and monument in 1997 by the team of Institute of Rock Structure and Mechanics of the Czech Academy of Science in Prague. The first common GPS observation campaign of both networks was performed in August 1997, second in September 1998. GPS observation data of both campaigns were processed by the authors using Bernese GPS Software v. 4.0. Observation data of the local networks were processed and adjusted both: as the independent free networks and as the networks connected to the EUREF permanent stations network (data from three EUREF stations: GOPE, MOPI and WROC were included to the processing). The first results of the processing show that the accuracy of the point position determination, using GPS observation, on the level of one millimetre is possible to achieve. The general strategy of the GPS data processing of these networks, using CODE and EUREF products, is presented in the paper. The preliminary results of the GPS data processing are shown and commented in geodetic focus.

NEOTECTONIC AND RECENT MOVEMENTS OF THE EARTH CRUST IN POLISH PART OF THE SUDETEN AND THE SUDETIC FORELAND

S. Cacoń¹, S. Dyjor²

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² Polish Geological Institute

Lower Silesian Branch, Wrocław

The Sudeten and Sudeten Block region constitutes the north-east border of the Czech Massif. During the Alpine Orogenesis it had formed a resisting block for the folding Western Carpathians. The current orographic picture of the region is the result of tectonic movements, the culmination of which occurred in Neogene.

Geodetic and geological studies show that those movements have not yet ceased. Historical records, which mention earthquakes since the X century, confirm this. National precise leveling measurements carried out in the last one hundred years show vertical movements of the crust of $-(2-4)$ mm per year. The greatest vertical displacements of -93 mm were recorded in the Graben of Paczków in years 1953 to 1975.

Three geodynamic polygons were set up in the Eastern Sudeten and Sudeten Foreland. These are: "The Table Mountains" (1972), "Massif of Snieżnik" (1992) and "Paczków Graben" (1993). Periodic satellite GPS, geodetic, gravimetric and relative (using gap gauge TM-71) observations produce evidence of vertical and horizontal displacements of the upper lithosphere. In 1996 the "GEOSUD" (GEOdynamics of SUDeten) project allowed for unification of all the periodic observations into one monitoring system. In 1997 the studies carried out within the "GEOSUD" project were integrated into the "SILESIA" network in the north part of Moravia (Czech Republic).

THE INVESTIGATIONS OF THE UPPER LAYER OF LITHOSPHERE DEFORMATION IN POLISH PART OF THE ŚNIEŻNIK MASSIF – RESULTS FROM TERM 1992-1997

O. Jamroz

Department of Geodesy and Photogrammetry
Agricultural University of Wrocław

Area of Eastern Sudety and Sudety Foreland are the most active neotectonical part of Poland. The results of structural and geological investigations indicate that the process of the tectonic movements has not been finish yet. Geodynamical network „Śnieżnik” connected with external reference network was founded in 1992 for monitoring deformation of upper layer of lithosphere of the Śnieżnik Massif.

Results of satellite, gravimetric, geodetic and some other measurements of crustal deformation from term 1992-1997 and some information about activity of Śnieżnik Massif vicinity were presented in the work.

GPS NETWORK "SUDETEN" AND ITS RELATION TO THE OTHER GPS NETWORKS IN THE SUDETEN AREA

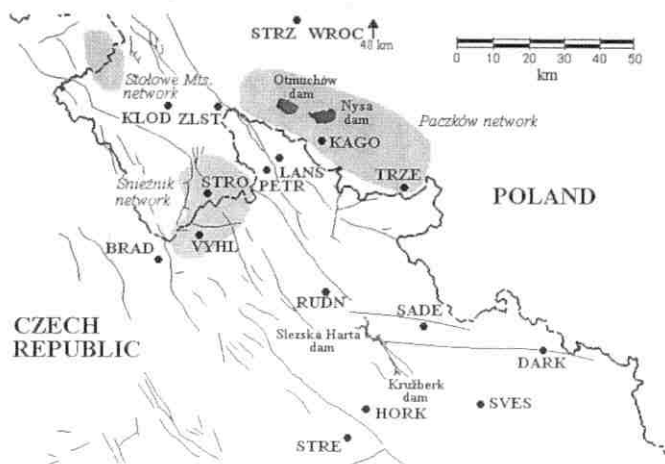
V. Schenk¹, S. Cacoň², Z. Schenková¹, P. Kottnauer¹

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² Department of Geodesy and Photogrammetry, Agricultural University of Wrocław

The first attempt to extend the local geodynamic monitoring systems to a regional concept was initiated for the Polish and the Czech Sudety Mts. at "Szczeliniiec" and "Ostaš" rock natural parks and the Bear Cave in the "ŚNIEŻNIK Mts.". The following networks were established by the Agricultural University of Wrocław both on natural objects (rock natural parks, caves) and on man-made objects (brown coal quarries, dams): STOŁOWE Mts., ŚNIEŻNIK, open-pit mine TURÓW and PACZKÓW. ŚNIEŻNIK network was built together with the Technical University of Brno. These networks have been called in 1996 as the GEOSUD network.

In 1997 the regional geodynamic network SUDETEN was established by the Institute of Rock Structure and Mechanics in the Eastern Sudeten. Its length is approximately 150 km in the NW-SE direction and approximately 80 km in the perpendicular direction. The GPS points, in a form of concrete blocks with a base of 40x40 cm and height between 40 and 120 cm, were built on places of hard rock outcrops and/or very stable structures. The main goals of the SUDETEN network is an identification of recent mobile active zones, a motion potential classification of particular geologic blocks and a verification of a possible mobile activity of significant equatorial faults. During two GPS campaigns (1997, 1998) simultaneous GPS monitoring on Czech and Polish points was performed. It means that the regional network SUDETEN does not monitor only the recent geodynamic processes occurring in a large area in the Central Europe but also creates an umbrella to all existing GPS networks.



APPLYING A MULTILEVEL SYSTEM FOR FIELD MASS MOVEMENT MONITORING IN SUDETY REGION

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²Department for Geodesy and Photogrammetry, Agricultural Faculty, Wrocław

A demand to monitor marginal sandstone block movements in Stolowe Góry Mts. called forth a program to develop a multilevel system in which measurement techniques in three levels of sensitivity are integrated: 1. Geodetic spatial network; 2. Local network; 3. Detailed point measurement by TM71 instrumentation. A series of objects in different programs, notably the Bear Cave in the Sněžnik area, were equipped and monitored later providing results important technically and scientifically. The approach, used methods, and investigated objects are described in outlines. An example of deformations monitored in detail on tectonic structures in the Bear Cave and registered in recent years are given and discussed to demonstrate problems in the geodynamic interpretation of such results.

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