The 2014 International EMSEV meeting on Electromagnetic Studies of Earthquakes and Volcanoes

The 17th International Workshop organized by the IUGG EMSEV Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes was held in Konstacin-Jeziorna nearby Warsaw, in Poland, from September 22 to 26, 2014 (http://emsev2014.cbk.waw.pl/, http://www.emsev-iugg.org/emsev/). This workshop was supported by IAGA, IAVCEI and IASPEI Associations, and was hosted by the Institute of Geophysics and the Space Research Centre with the contribution of the Polish Academy of Science. Professor Jan Blecki with the help of very powerful local organizing committee produced a very successful, efficient and smoothly run meeting.

The focus of the meeting was on the observation and understanding of the various kinds of electromagnetic phenomena associated with seismic and volcanic activities, particularly from a multidisciplinary point of view. Session topics covered the following areas of interest: (1) Physics and Observations of Earthquake Preparatory Processes, (2) Constraints from Seismology, Geodesy and Other Geophysical Techniques, (3) Electrodynamics in Solids and Rock Materials – Theory and Laboratory Results, (4) Related Electromagnetic Signals and Other Physical Parameters to Earthquakes – Ground Base and Satellite Observations, (5) Related Electromagnetic Signals and Other Physical Parameters to Volcanoes, Geothermal Fields and Landslides – Ground Base and Satellite Measurements, (6) Signal Recognition, Data Processing and Modeling, and (7) Future Experiments, Missions and Theoretical Developments.

More than 60 participants from 16 different countries attended the meeting and presented their most up-to-date results in oral presentations and with posters. The posters were displayed in the central meeting area during the meeting with significant results from each identified in short 2-minute summaries before the general poster viewing. In addition, invited talks on global-scale prediction of earthquakes, earthquake mechanics, volcano seismology, and geochemistry contributed to a better identification of the physical mechanisms involved in the generation of electromagnetic signals related to both volcanic and earthquakes activity.

The presentations during the meeting clearly show the incredible progress made in documentation of reliable electromagnetic signals related to earthquake and volcano activity during the thirteen-year existence of EMSEV. Many powerful international groups have been set up and cross-correlations between electromagnetic and other geophysical data have successfully emerged. The two activities promoted by EMSEV in under-developed countries related to volcanic (Taal volcano, Philippines) and tectonic activities (Bishkek, Kyrgyzstan). Each now involves powerful consortiums for joint observations. For Taal, experts from the Philippines, Japan, France, USA, Belgium, Italy, and Greece are working together while, in Kyrgyzstan, joint efforts involve researchers from Kyrgyzstan, Russia, Japan, France, Greece, China and Poland. The identification of signals related to the transient disturbances of the ionosphere that might be associated with earthquakes is the target of a cooperative effort between USA, Japan, Russia, Taiwan, and France. Renewed and enthusiastic interest in using satellites to identify precursory EM signals related to earthquakes and volcanic eruptions will follow the launch of Chinese micro-satellites in 2016. Already, our EMSEV community is getting together on this issue.

The round table at the end of the meeting raised discussions on different topics particularly the testing of predictability of EM and other geophysical parameters for impeding earthquakes and eruptions. If signals are occasionally identified, it is extremely difficult to demonstrate reliable and repeatable estimates precursor time delay, likely magnitude and likely location for an earthquake, although it is much easier for volcanic eruptions. Some proposals discussed were the importance of re-analyzing very long time series (i.e. over ten years) to build database of reliable characteristics of signals, to produce 4-window tables corresponding to Anomaly (A) with Earthquake (EQ), A with No EQ, No A and EQ, No A and No EQ, and to work on the repeatability of signals such as in the case of the recurrent seismicity in Taiwan. The methodology on precursory electric signals used in Greece is now in the process of being tested in Kyrgyzstan and Romania.

During the 17th business meeting, Professor Xuebin Du, from Lanzhou Institute of Seismology of China Earthquake Administration, offered to host the next EMSEV meeting in 2016. This proposal was accepted, and Chinese colleagues will discuss how to involve the largest possible Chinese community.

Detailed information on EMSEV activities can be found at http://www.emsev-iugg.org/emsev/.

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Visit of the lively city of Warsaw, September 24, 2014