

2011-2012 EMSEV Report for IASPEI

1. EMSEV

The Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV, <http://www.emsev-iugg.org/emsev/>) is a transverse working group supported by IAGA, IAVCEI and IASPEI Associations under IUGG leadership.

EMSEV primary objectives are to understand earthquakes processes and volcanic eruptions, and to get the capability to detect and analyze electromagnetic (EM) signals related to active tectonic processes. These goals require expertise in many fields of researches: physics of the Earth Interior, physics of the fault rupture and volcanic eruptions, laboratory experiments, physical mechanisms generating magnetic, electric and electromagnetic signals, role of fluids, gas and thermal fluxes in the crust, and propagation of EM signals.

Therefore, EMSEV actions are (i) to promote international collaboration and co-operation between individuals and research groups, (ii) to develop EM methods in developing countries based on joint research, workshops and educational plans, (iii) to support the dissemination and discussion of relevant data and results and (iv) to organize international and regional meetings as well as specialized sessions at General Assemblies.

Every year EMSEV holds Business meetings during which new findings are evaluated, new directions of researches are encouraged, and international projects are promoted (see reports at <http://www.emsev-iugg.org/emsev/page005.html>).

2. ORGANIZATION

EMSEV is composed of an elected executive bureau, a nominated assembly of members and collaborators, and the community interested in EM phenomena, called corresponding members. A new body, called *EMSEV collaborators*, was formulated during EMSEV 2012 meeting. This body is intended to include active scientists working in Natural Hazards in any related field of research whose expertise's does not necessarily belong to the EM field but are interested in, and wish to contribute to the development of new broader geophysical knowledge. The number of EMSEV corresponding members now exceeds 290. Any request concerning mailing list and information, and future plans can be mailed to Toshiyasu Nagao, EMSEV Secretary (nagao@scc.u-tokai.ac.jp).

3. 2011-2012 ACTIVITIES

3.1. Meetings

In 2011, the main contribution was made during the 2011 IUGG General Assembly in Melbourne (Australia) where four coordinated EMSEV sessions were organized. EMSEV has also organized sessions at EGU-Vienna (Austria), USRI GA-Istanbul (Turkey), AOGS GA-Tapei (Tawain), and AGU-San Francisco (USA).

In 2012, the international EMSEV meeting was held at Gotemba, Japan from September 30 to October 3. It was organized and hosted by Tokai University. More than 75 participants from 13 countries, including ten new young scientists, presented their latest results. As in 2011, EMSEV was involved in many International meetings: EGU-Vienna (Austria), ESC 2012 GA-Moscow (Russia), AOGS AGU-Singapore (Singapore), AGU-San Francisco (USA), and GeoRisk Conference-Santa Anna (USA).

3.2. EMSEV activity related to Earthquake Processes

In 2011, the EMSEV started a new research effort. We have developed a cooperative research program with the Bishkek Research Station in Kyrgyzstan under the Russian Academy of Sciences where some outstanding research on the relation between EM phenomena and electrical resistivity changes has been studied with practical field experiments. Here earthquakes have been occurring for the last 30 years. In November 2011, teams from Japan, France and Greece visited Bishkek Research station. A meeting was held in which a synthesis of the past results were described. Furthermore, Japanese and French passive EM stations were installed at new field sites, 40 and 30 km away from the current system used by Kyrgyz colleagues (600 A, length of dipoles 4 km). Joint data processing systems are now implemented. A cooperative agreement between EMSEV and the Bishkek Research Station was signed for 4 years period. The first data derived from the collaboration were shown at the 2012 EMSEV meeting (<http://www.emsev-iugg.org/emsev/index.html>).

3.3. EMSEV activity related to volcanoes

EMSEV began a co-operative program with the "Philippines Institute of Volcanology and Seismology" (PHIVOLCS, <http://www.phivolcs.dost.gov.ph/>), on Taal volcano in November 2004. At present, this international cooperation involves teams from Japan, France, USA, Greece, Italy, and Belgium. Joint field trips were conducted in February-March and November-December, 2011 and 2012. Simultaneously with repeated surveys, EMSEV and PHIVOLCS have now built a real-time monitoring network based on EM and other geophysical parameters as magnetic and electric fields, ground temperature and gradients, seismicity, and tilt. Data of three stations are automatically transferred to Taal volcano observatory, PHIVOLCS headquarter and EMSEV servers. Six articles have now been published based on this research project results.