2012 Meeting of IASPEI/IAGA/IAVCEI Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV)

http://www.emsev-iugg.org/emsev/

October 3, 2012, Gotemba, Japan

Following the 2010 conference held at Chapman University, Santa-Ana, USA, the 2012 international meeting of EMSEV Inter Associations on Electromagnetic Studies of Earthquakes and Volcanoes (http://www.emsev-iugg.org/emsev/) took place at Gotemba Kogen Resort, Gotemba City, Shizuoka, Japan, from September 30 to October 4, 2012 (http://www.emsev-iugg.org/emsevJAPAN/). The meeting place was in front of the 3776m high and active Mount Fuji volcano. This meeting was supported by the three IUGG Associations (IAGA, IASPEI and IAVCEI) to which EMSEV belongs, SGEPSS (Society of Geomagnetism and Earth, Planetary and Space Sciences) and Tokai University,

Mt. Fuji in front of the workshop site, about 22 km east from the summit.

For three days (October 1-3) more than 75 participants from 13 countries, including ten new young scientists, presented their latest results at both plenary oral and poster sessions. Papers were organized within five different sessions, (i) Electric, magnetic, and electromagnetic phenomena associated with active processes: earthquakes, tsunamis, volcanoes, active fault movements, landslides, and geothermal activities, (ii) Electromagnetic imaging based on land and space monitoring techniques, (iii) Pre-seismic, co-seismic and post-seismic phenomena related to the Lithosphere- Atmosphere-Ionosphere Coupling using multi-parametric observations to ensure reliable interpretation, (iv) Generation mechanisms of electromagnetic signals related to active processes: Theoretical and laboratory studies, and (v) Seismic, Geodetic and Electromagnetic studies related to the off Tohoku M9 Earthquake and tsunami on March 11, 2011. The session (iii) was dedicated to late Professor Oleg Molchanov, Russia, one of the most active EMSEV members, who passed away last year.

The lively discussions have shown that more and more reliable observations of abnormal

electromagnetic variations may be recorded before earthquakes and volcanic eruptions. They may be observed with the magnetic or electric field in ground-based stations, with regional disturbances of broadcast radio emissions in the atmosphere, and with electromagnetic, electronic and plasma changes in the ionosphere, and by infra-red anomalies detected by satellites as well. Different mechanisms at the origin of these signals were formulated (heat or/and gas release, ionization of the air, transfer of electric charges, etc.). And for the first time, several laboratory measurements were discussed at depth in order to provide a basis for physical mechanisms.

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The meeting was followed by general discussion concerning EMSEV activities in developing/interested countries. In Volcanology, EMSEV first formed a co-operative program with The Philippines Institute of Volcanology and Seismology (PHIVOLCS), on Taal volcano in November 2004. (http://www.phivolcs.dost.gov.ph/). At present, this international cooperation now involves teams from Japan, France, USA, Greece, Italy, and Belgium. A report on the state of the cooperation, discussions of problems encountered and the latest results were presented during EMSEV 2012 meeting. It was pointed out that EMSEV has a primary responsibility to help PHILVOLCS to monitor the volcano. On Active faulting, the EMSEV working group started a new cooperative research effort with Kyrgyzstan (Bishkek Research Station) in 2011. At this site an active electrical resistivity experiment using an extremely high power magneto- hydrodynamic (MHD) generator is being used to induce earthquakes and some outstanding research on the relation between EM phenomena and electrical resistivity changes with earthquakes has been accomplished during the last past 30 years. A formal cooperation Agreement between EMSEV and Bishkek Research Station was signed in November 2011. The purpose of this Agreement is to provide scientific and technical interaction between the two partners during a 4-years collaborative research on active faults and physical processes generating earthquakes in Central Asia, to promote new investigations with

electromagnetic and other geophysical methods, and to enhance data processing and analyses. The Agreement will promote the development of scientific relations between participants for solving fundamental problems on the generation of earthquakes and the way to monitor and mitigate them along different active faults of Central Asian continental lithosphere.

At the EMSEV business meeting, it was announced that the next volcanological meetings will be 'Cites On Volcanoes 7' (COV7) at Colima, Mexico, during November 18-23, 2012, and 'IAVCEI Scientific Assembly-2013' at Kagoshima, Japan, during July 20-24, 2013. At the latter meeting, EMSEV has proposed a session entitled 'Land and satellite multi-parameter observations of active volcanoes and geothermal fields: Electromagnetic and other geophysical methods for imaging and monitoring ongoing activity' (Convenors: Zlotnicki, Sasai, Johnston, Tramutoli, Currenti, Hashimoto).

Participants just in front of the Hoei Crater.

On the final day of the workshop (October 4), participants joined a field excursion to Mt. Fuji and Hakone volcano. Participants visited the Hoei crater of Mt. Fuji, halfway up on the southern slope of the volcano. The eruption took place from this newly-formed crater in 1707, only 45 days after the great Hoei earthquake of M 8.6, a large subduction quake along ~1000 km long Nankai Trough. Petrologists suggest that there might be some intruded magma batch which may cause the next eruption after 300 years' repose. How to detect such an intrusive dyke by EM methods was discussed. Participants visited the geothermal field of Owaku-dani, Mt. Hakone, which is the most popular sight-seeing place near Tokyo. Several foreign participants then visited Sendai, Tohoku region, where some ruins of tsunami waves due to the Great Tohoku Earthquake of M 9.0 on March 11, 2011, still remain.