

**11th Business Meeting of IASPEI/IAGA/IAVCEI Inter-Association
Working Group on Electromagnetic Studies of Earthquakes and
Volcanoes (EMSEV)
September 10, 2008, Sinaia Hotel, Sinaia, Romania**

1. Participants:

Zlotnicki, Jacques (Chair)
Nagao, Toshiyasu (Secretary)
Johnston, Malcolm (Vice-Chair and IASPEI liaison member)
Uyeda, Seiya (Past-Chairperson)
Blecki, J., Space Research Center/PAS, Warsaw, Poland
Demetrescu, Crişan, Inst. Geodynamics, Romanian Acad., Romania
Du, Xuebin, CEA, Lanzhou, China
Harada, Makato, Tokai University, Japan
Hattori, Katsumi., Chiba University, Japan
Hase, Hideaki, University Hokkaido, Japan
Izutsu, Jun, Chubu University, Japan
Lapenna, Vincenzo, University of Basilicata, Italy
Lazaridou, Mary, University of Athens, Greece
Liu, Jann-Yenq, National Central University, Taiwan
Nishihashi, Masahide, Chiba University, Japan
Mateciuc, D., National Institute for Earth Physics, Magurele, Romania
Omori, Yasutaka, Tohoku University, Japan
Ouzounov, Dimitar, NASA GSFC/SSAI, USA
Parrot, Michel, LPCE/CNRS, France
Patroi, Aura, Inst. Geodynamics, Romanian Acad., Romania
Ma Qinzhong, Earthquakes Administration of Shanghai, China
Stanica, Dimitru, Inst. Geodynamics, Romanian Acad., Romania
Stanica, Dragos Armand, Inst. Geodynamics, Romanian Acad., Romania
Sasai Yoichi, Tokyo Metropolitan Government, Japan
Singh, Ramesh, George Mason University, USA
Takahara, Kazutaka Tohoku University, Japan
Takano, Tadashi ISASA/JAXA, Japan
Tohbo, Izumi, Tohoku University, Sendai, Japan
Vargemezis, G., University of Thessaloniki, Greece
Varotsos, Panayiotis, University of Athens, Greece
Vasile, Ionela, Inst. Geodynamics, Romanian Acad., Romania
Visan, Madalina, Inst. Geodynamics, Romanian Acad., Romania
Vladoiu, Dan, Inst. Geodynamics, Romanian Acad., Romania
Vladimiresc, Nicoleta, Inst. Geodynamics, Romanian Acad., Romania
Yamazaki, Ken'ichi, University of Tokyo, Japan
Zhou, Kechang, China Earthquake Network Center, China
Zoran, M., National Institute for Optoelectronics, Bucharest-Magurele, Romania

2. Opening Remarks, 1800hr: J. Zlotnicki: Chair

Jacques Zlotnicki opened the meeting and welcomed all. He pointed out we face important tasks in planning 2009 activities and then briefly summarized the objectives of EMSEV. Jacques then put into perspective, the position that EMSEV has in relation to the various associations within IUGG. As far as IUGG is concerned, Jacques met the chairman of IUGG in Moscow earlier this year and found strong support for what we are attempting to do. For the various associations, we are getting good support from IASPEI, our activities are very welcome in IAVCEI in contrast to some of the other IAVCEI groups who rarely meet and are at risk of being disbanded. IAGA has always supported EMSEV for its scientific work and activities. The power of EMSEV comes from the considerable expertise of members in the three associations; EMSEV has to keep a good balance between the three associations and related topics.

3. Web Site

Toshiyasu Nagao then summarized the features of the EMSEV web site. Including Objectives, Mailing lists, the EMSEV bureau and members, lists of meetings (past and future) and reports. Of particular importance is the fact that the EMSEV web site is now linked to each of the association web sites. This allows easy dissemination, for example, of our 2007 Annual Report, minutes of our meetings and summaries of our plans. The URL of this site is

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

Toshiyasu emphasized the importance of communication by email and the ability to archive past email messages. At present, the EMSEV mailing list is limited to a message size of 50 Kb. Messages should not include attached files since this system is designed primarily for text messages. Larger size email should be sent to T. Nagao: nagao@scc.u-tokai.ac.jp It is expected that the storage capability will be increased to 40 Gb on October 1, 2008. This could allow exchanging of papers, data, and presentations. The number of EMSEV mailing list members is now 245.

4. Reports from liaison officers:

IASPEI - Malcolm Johnston (IASPEI liaison) emphasized good relations within IASPEI and in particular with the secretary Peter Suhadolc. Peter was particularly helpful in Perugia getting session agenda printed and distributed. IASPEI is currently providing support for this meeting and also will be providing some support for participants from under developed countries such as Indonesia and the Phillipines. Of particular importance for 2009 is the upcoming IASPEI General Assembly on January 10-15 in Capetown, South Africa. We hope that some participants from EMSEV will be able to make this meeting. The abstracts due date is September 30, 2008.

IAVCEI – Yoichi Sasai (IAVCEI liaison) mentioned that he attended the Cities on Volcanoes5 (COV5) meeting in Shimabara, Japan and had discussion with Setsuya Nakada, the current president of IAVCEI, about use of EM techniques on volcanoes for hazard reduction. Yoichi Sasai proposed that EMSEV members organize an EM session for the IAVCEI meeting, Cities on Volcanoes6 (COV6) to be held at Tenerife, Canary Islands on November 16-20, 2009. He then summarized the EMSEV efforts on Taal volcano. This is working well with good stable magnetic and electric field data being collected prior to any serious volcanic activity.

IAGA – Tiger Liu (IAGA Liaison) reported on the possibility and importance of a joint meeting in China, preferably not too long after the 2008 M7.9 Sichuan earthquake. He also discussed the bilateral Italian-Japan meeting in Chiba, Japan for which 80 people attended from Taiwan, Iran and Italy. Discussion covered three days. Of particular interest was a new system of EM analysis developed in Italy.

5. EMSEV activities 2007-8:

5.1 Bilateral Seminar Italy-Japan on Electromagnetics in Seismic and Volcanic areas July 25-27, 2007, Chiba, Japan.

Conveners and LOC: M. Hayakawa, K.Hattori and L. Telesca
Tiger Liu reported that 80 people attended from Taiwan, Iran and Italy. Discussion covered three days. Of particular interest was a new system of EM analysis developed in Italy.

5.2 EMS-07 Third international school-seminar on electromagnetic sounding of the earth (EMS-07), Zvenigorod, Russia. 3-8, September 2007 organized by V. Spichak.

Jacques Zlotnicki reported that, in spite of the high technological level of the meeting, there were not many new scientists attending this seminar because private companies early in their careers had employed them.

5.3 EGY 50 years of the International Geophysical Year and the International Electronic Year, Suzdal, Russia, 16-19, September 2007, organized by A. Gvishiani (Geophysical Centre, Acad. Sci.). Session on Russian-French research on Geophysics, Volcanology and Seismic Danger; EM applications.

5.4 The 8th China International Geo-Electromagnetic Workshop, 11-14 October 2007, Yangtze University, Jingzhou, Hubei, China.

5.5 COV5, Cities on Volcanoes, Japan

See report above by Yoichi Sasai

5.6 IWSEP 2007

Indonesia, International Workshop on Seismo-Electromagnetic Phenomena, November 6-7, 2007 at Bandung, Indonesia, Conveners: Djedi S. Widarto, Sarmoko Saroso, Katsumi Hattori.

Katsumi Hattori mentioned that about 100 persons attended and a report was sent to Jacques Zlotnicki. Countries represented at this two-day meeting included China, India, France, Japan, Taiwan and Germany. There were also representatives from China Earthquake Council and various space agencies. The meeting was supported by Badan Meteorologi dan Geofisika (BMG). BMG may provide support in the future including for instrumentation.

5.7 3rd International Geohazards Workshop

November 5-9, 2007 organized by ESA (European Spatial Agency)

The 3rd International Geohazards Workshop aimed to strengthen the emerging international strategy for disaster mitigation and prevention for the benefit of those exposed to geohazards, namely earthquakes, volcanoes, landslides, and tsunamis.

Session: GeoHazards; Hazards database, Science and Observations

5.8 2007 AGU Fall meeting.

Dimitar Ouzounov summarized the session, “Theory and Applications of Electromagnetic and Thermal Anomalies during Earthquakes”, convened by Dimitar Ouzounov, Sergey Pulinets, Michel Parrot, Katsumi Hattori and Patrick Taylor. 32 presentations were made and about 120 people attended.

5.9 IWSEO2008 International Workshop on Seismo-Electromagnetic Observation Satellite, JAPAN on Feb. 29-March 1, 2008 (Secretary: Tetsuya Kodama, Chair and Co-chair: Kiyohumi Yumoto and Katsumi Hattori).

Cosponsored by EMSEV/IUGG an International Workshop on Seismo-Electromagnetic Observation Satellite, Japan on March 1, 2008 (Chair and Co-chair: Kiyohumi Yumoto and Katsumi Hattori)

At this session there were 5-6 speakers

5.10 EGU, Vienna, 13-18 April, 2008

Session NH5.1

Seismic hazard evaluation, precursory phenomena and reliability of prediction (co-listed in SM & TS); Convener: Contadakis, M. Co-Convener: Biagi, P.; Zschau, J.

Session: NH5.2

Electric, magnetic and electromagnetic phenomena related to earthquakes (co-listed in SM & TS); Convener: Biagi, P., Co-Convener: Hayakawa, M.; Molchanov, O.; Vallianatos, F.

5.11 AOGS 2008 Meeting, Busan, Korea (July 16-20, 2008).

Tiger Liu summarized the session at this meeting

5.12 URSI GA 2008 Chicago (9-16 August 2008), Seismo-electromagnetics, Conveners: M. Parrot, S. Pulinets, O. Molchanov

5.13 IAVCEI 2008 Reykjavik, Iceland

Session: New insights from Electromagnetic (EM) Investigations of Active Volcanoes and Hydrothermal/Geothermal Fields. Conveners: J. Zlotnicki, M. Johnston and R. Karlsdottir.

Talks and posters were presented in three different sessions:

2-f: Advances in electromagnetic investigations of active volcanoes and hydrothermal fields

2-b: Integrated monitoring and modelling of volcanic activity

3-e: Volcanic and geothermal systems at the Earth’s surface: From fumaroles and mudpools to volcanic lakes.

J. Zlotnicki and M Johnston attended a meeting with the IAVCEI executive committee headed by Joan Marti who expressed support for our efforts, particularly in under developed countries.

5.14 EMSEV-DEMETER 2008 Sinaia, Romania; Dates: September 7-12, 2008, LOC-chair: Dimitru Stanica

The Workshop was organized in six sessions: **1. Seismicity and seismotectonics of Vrancea zone. Inter-correlation with other seismogenic zones; 2. Electric, magnetic, and electromagnetic methods related to earthquakes, tsunamis, volcanic eruptions, landslides and geothermal activities; 3. Integration of multi-technique monitoring. Cross-correlation between ground and satellite observations; 4. Generation and propagation mechanism of EM signals,**

and related laboratory experiments; 5. Study of ionospheric perturbations, GPS based measurements; 6. Imaging active faults, volcanoes, landslides and geothermal fields by EM methods. Integration of other methods: geophysical, geochemical, geological, etc.

The Workshop sessions included 48-scientific presentations and stimulating discussion. The papers were presented by scientists from 13 countries – China, Czech Republic, France, Greece, India, Iran, Italy, Japan, Poland, Romania, Russia, USA and Taiwan.

The Workshop provided an excellent opportunity to establish close contacts with Romanian colleagues.

5.15 AGU 2008

The session of interest is “Search for Large Earthquake Precursors from Space and Ground Observations”, convened by: Dimitar Ouzounov, Patrick Taylor, Sergey Pulinets, J.Y. Liu, Katsumi Hattori, and Michel Parrot. In order to provide wider exposure, a number of invited papers are planned including one from Kelis Borok. About 30 papers are expected.

5.16 IASPEI General Assembly, Capetown, South Africa (10-16 January, 2009).

Sessions of interest to EMSEV are:

EARTHQUAKE SOURCE and PREDICTION

Symposium on Earthquake sources: Modeling and Monitoring for Prediction

Geophysical anomalies and Earthquake prediction

Prospective Testing of Earthquake and Faulting Probability Models

HAZARD AND RISK

Earthquake Hazard

Earthquake Risk

Workshop "Effects of Surface Geology"

Seismic Source Modeling and Ground Motion Prediction

Earthquake Risk Reduction and Preparedness: Socio-economic aspects, particularly in developing countries

APPLIED GEOPHYSICS

Electromagnetic prospecting and crustal structures

6. Plans for 2009:

6.1 EMSEV business meeting during the China meeting on the Wenchuan May 2008 earthquake.

Dimitar Ouzounov has proposed organization of a session on ‘Satellite EM observations related to earthquakes’. Discussion is now in progress to extend the session to include “Land and satellite EM observations related to earthquakes”.

6.2 IAGA General Assembly, Sopron, Hungary (23-30 August, 2009)

I06. Crustal tectonic processes constrained by electromagnetic observations

Div. I: Study of the crustal processes helps to delineate the natural resources, seismically active zones, geothermal regions etc. The session is devoted to research contribution of electromagnetic studies in resolving structural features of crust ranging from Achaean to Recent in age. Recent review paper on EM investigations of the lithosphere in Europe provided an overview of the large-scale EM surveys on a regional scale. We particularly invite such large-scale studies. The session

also addressed the role of EM in monitoring crustal processes. EM monitoring of seismic and volcanic processes have examined correlation of electrical resistivity models with crustal melting, seismicity, and fault zones. Convener: T. Harinarayana, Magnetotellurics Division, National Geophysics Research Institute, Uppal Road, Hyderabad – 500 007, India; tel: +91 40 23434613; fax: +91 40 23434651; e-mail: thari54@yahoo.com. Co-convener: Yasuo Ogawa, Tokyo Institute of Technology, Japan.

6.3 Cities on Volcanoes 6 (COV6) Tenerife, Canary Islands 16-19 November, 2009

We expect that EMSEV will organize a session at this meeting. The organizing committee agreed to support this. This will be a good meeting opportunity to include people who are not ordinarily able to attend these meetings. There was some discussion on how to make the grant system work better as several who have got grants in the past were still not able to get to the meeting.

6.4 AGU Fall Meeting, 2009

6.5 PHILVOLCS-EMSEV meeting 2009-2010:

In the frame of “Monitoring Taal volcano unrest in Philippines based on a joint Electromagnetic and multi-disciplinary educational EMSEV-PHIVOLCS program”, a specific workshop could be held at the beginning of 2010 at PHIVOLCS headquarter, Manila.

7. Plans for 2010:

7.1 EMSEV 2010 Meeting

7.2 USRI 2010 Meeting in Istanbul

Michel Parrot will organize one session

8. Plans for 2011:

8.1 IUGG General Assembly in Melbourne, Australia (27 June – 8 July, 2011)

IAVCEI Executive committee has asked the WG to propose sessions.

9. IUGG Grants Program 2008-2011

5-a EMSEV submitted one proposal to IUGG based on the on-going cooperation with PHIVOLCS on volcanoes “Monitoring Taal volcano unrest in Philippines based on a joint Electromagnetic and multi-disciplinary educational EMSEV-PHIVOLCS program”

The IAGA and IAVCEI Associations supported the project.

IUGG Executive Committee, at its meeting in Karlsruhe in August 2008, reviewed the recommendation of the IUGG Bureau regarding the project and decided to award the project. The amount of the IUGG grant is US\$9,300 for the 2 years project. In addition to the research and training program, EMSEV will organise a small workshop.

5-b In July, EMSEV and PHIVOLCS signed a memorandum Memorandum of Agreement on the Use of Geomagnetic Data from Muntinlupa Magnetic Observatory (Philippines) National Mapping and Resource Information Authority (NAMRIA), The Ocean Hemisphere Research Center, Earthquake Research Institute (OHRC-ERI), the Philippine Institute of Volcanology and

Seismology (PHIVOLCS), the IUGG Inter-Associations Working Group on Electro-magnetic Study of Earthquakes and Volcanoes (IUGG-EMSEV).

10. EMSEV Budget

2007 Funds Received:

Remaining from (IUGG-2007; Perugia): \$3500

2007 Funds Outgoing - Nov. 2007 (Taal field work; PHIVOLCS): -\$1200

Remaining 2007 Funds: \$2,300

2008 Support Request:

- IUGG, EMSEV general activity: received 1380 Euros (\$2000)
- IAGA, International cooperation: received 710 Euros (\$1,000)
- IASPEI, EMSEV 2008 meeting: received \$1,000
- IAVCEI, IAVCEI meeting (Iceland): Support for IUGG grant
- *IUGG Taal volcano proposal; Received \$9300 grant for 2 years.*

EMSEV 2008 Balance:

Outgoing

- EMSEV 2008: IUGG support to participants: 320 Euros
- IASPEI support for Capetown IASPEI GM: \$500
- IASPEI support to developing countries: \$500

Remaining budget on September 12, 2008 for EMSEV general activities:

- \$2,300
- 1,770 Euros

Proposed expenditures at EMSEV meeting (Sept.10)

Philippines workshop: invitation for developing countries [about 2000 Euros]

IASPEI support to developing countries: seismometer and tiltmeters (participation) [about \$500]

Cities on Volcanoes (EMSEV session) [about 1,500 Euros]

Appendix 1: EMSEV Romania meeting support:

Candidate	Email	Proposed support	Accepted/used
Shivalika Sarkar	20080707	600 Euros	x / Did not attend
Ramesh Singh	20080704	250 Euros	x / Attended
Djedi Widarto	20080704	250 Euros	Did not attend
Baldev Arora	20080704	250 Euros	Did not attend
Total		1350 Euros	250 Euros

11.EMSEV Structure

For general information the EMSEV WG is composed of three bodies:

- The **Bureau** (Chairman: Jacques Zlotnicki, Vice-Chair: M. Johnston, Past Chair: S. Uyeda, Secretary: T. Nagao, IASPEI liaison: M. Johnston, IAVCEI liaison: Y. Sasai, IAGA liaison: J-L Liu, IAG WG1.2 representative: T. Harinarayana
- The **EMSEV members**. There are 35 members (14 countries) with generally not more than five per country to ensure international and interdisciplinary balance.
- The **EMSEV corresponding members**, about 220 in number, include all (i.e., any number per country) who are interested in EM aspects of earthquakes and volcanoes and have joined the EMSEV mailing list.

12. New memberships

To keep the organization strong and active, Seiya Uyeda suggested we continue to update our EMSEV members list. The following were nominated as new members:

Dr. Renato Solidum, Jr. (PHILVOCS, Phillipines) as national representative of Phillipines EM survey.

Prof. Zhao, Guoze (China Earthquakes Networks Center, CEA). Chairman of geoelectric committee, Chinese Geophysical Society.

Prof. Lu, Jun (China Earthquakes Networks Center, CEA). Leader of earthquake prediction efforts using geoelectric methods at CEA.

Prof. Du Xuebin (China Earthquake Administration – Lanzhou). Leader of geoelectric data and processing.

There was some discussion about the last nomination concerning whether all the Italian representatives would agree that Prof. Sgrigna would be the best choice for an additional representative for Italy in this field. Because of the lack of knowledge, it was suggested that the Italian delegation should decide whether this is the case. Prof. V. LaPenna was asked to determine this result. This nomination was put on hold pending this. Other nominations were carried with acclamation.

It was also decided that the following would be rotated off the membership list:

Zeng, Xiaoping, China Seismological Bureau, China

Zhan, Zhijia, China Seismological Bureau, China

Shapiro, Vsevolod, Inst. of Geophysics, Urals Dept. of RAS, Russia

13. Publication of Proceedings of the Sinaia EMSEV Meeting.

A plan exists to publish the proceeding of the meeting in either the Journal of Applied Geophysics or Annals of Geophysics with preference being for J. App. Geophys. D. Stanica and J. Zlotnicki will keep in contact with the Journal editor. It was decided that all potential authors who plan to submit a paper should let Toshi Nagao know within two weeks of the meeting. A show of hands at the meeting indicated that at least 10 papers would be submitted.

14. Free Discussion

14.1 CD of presentations.

It was suggested that all presentations might be put on a CD and given to all participants. It was not clear what the final decision was on this. On the other hand, presentations at the Sinaia meeting will be put on EMSEV Web site.

14.2 Web Link.

It was suggested that EMSEV adds a link on its Web site to the Web sites of EMSEV members who wish to provide information concerning their studies and their papers. The content of these Web sites will be of the responsibility of their authors.

14.3 Data Archive

D. Ouzounov suggested making a CD-ROM of all available data for specific earthquakes. The CD would be distributed to anyone who wants to try new techniques of study. A number of difficulties likely to be encountered when doing this were discussed. In particular: 1) It is difficult to process data without any knowledge about how these data are collected, 2) The tasks of cleaning and correcting data for instrumental and other problems and providing a detailed description of the data can be enormous.

It was concluded that cooperative studies between the involved groups would be a more efficient way to ensure data quality and correct interpretation. Another problem pointed out by Prof. Takana is data calibration.

14.4 2010 Meeting.

Ramesh Singh again confirmed George Mason University as the site of the next EMSEV meeting. Tiger Liu suggested Taiwan or China with the help of Prof. Du as a backup or a future meeting. The plan for the future when organizing meeting will be to send a letter of commitment to the Chairman of EMSEV to avoid confusion.

Ramesh Singh will send to EMSEV bureau updated information in the next months (organization, travel, cost, etc).

14.5 Seismological Review

Panayiotis Varotsos, noting the need to resolve the long lasting contrast in views on the reality of precursory electromagnetic signals, proposed to select a small group of eminent seismologists, provide them with all the factual documentations of the last 10-15 years and have them objectively judge whether predictions before major events, based on electromagnetic phenomena, have really been publicized in official journals in advance. He insisted that the judgment is as simple as telling whether the light is ON or OFF. To this proposal, Jacques Zlotnicki suggested that an EM group might go to Greece and study how the Greek SES measurements are made, which is the basis of processing reliable data. Varotsos said they always welcome the visit but that will not solve the problem. Seiya Uyeda pointed out that nothing new can be learned by that at this stage and further suggested that asking objective judgment of seismologists may be better conducted on a private basis rather than as a formal EMSEV action, since EMSEV couldn't be responsible for predictions made by members.

14.6 Joint Papers.

Tiger Liu pointed out the importance of joint papers.

14.7 Cooperative Work:

Jacques Zlotnicki agreed and again promoted joint work as the best way to get useful results.

The meeting was adjourned at 8:45 pm.

A group photo of participants taken at the Bran Castle:



(Credit: D. Ouzounov)