

**2th Meeting of IASPEI/IAGA/IAVCEI Inter-Association Working Group on
Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV)
Sept. 6, 2002, "President Hall" of RAS, Moscow**

Meeting started at 14:00

Participants:

EMSEV members:

JinQi Hao, China
Dumitru Stanica, Romania
Yuri Kopitenko, Russia
Yoichi Sasai, Japan
Jacques Zlotnicki, France
Malcolm Johnston, USA
V. Spichak, Russia
M. Gokhberg, Russia
J. Y. Liu, Taiwan
Mustafa Kelal Tuncer, Turkey
M. Parrot, France
F. Vallianatos, Greece
V. Korepanov, Ukraine
Oleg Molchanov, Russia
Pier Francesco Biagi, Italy
Toshiyasu Nagao, Japan
Seiya Uyeda, Japan
A. Meloni, Italy
V. Lapenna, Italy
Seva Shapiro, Russia

Non EMSEV members

Crisan Demetrescu, Romania
Ivan Varentsov
Saurabh K. Verma
Minakshi Dree ?
Fan Xing,
Toru Mogi, Japan
Igor Rokityansky, Ukraine
Adele Manzella, Italy
Pavel Aleksandrov, Russia
Valentin Maksymchuk, Russia

Matisahivili Tamaz, Italy
Vitali Morgounov, Russia
Gueze Zhao, China
V. Hegai, Russia
V. Kim, Russia
H. Tanaka
K. Hattori, Japan
Valerio Tramuoli, Italy
D. Di Mauro, Italy
John Bishop, Australia

[1] Background and history of EMSEV creation.

Uyeda (Chair) and Johnston (IASPEI/IAVCEI liaison member) reported on the writing of the initial proposal at the Birmingham 1999 IUGG meeting and the Terms of Reference set up by IUGG in accepting this proposal. The need for cross-interaction between different disciplines was identified as a fundamental purpose of the working group since researchers in EM studies have very diverse backgrounds. The process of EMSEV creation appeared of particular importance to several participants who were interested in the mechanics of creation, what such a working group could, or could not try to do, what is its political power (none) and what is its purpose (mostly to promote cooperation and collaboration).

[2] Membership, Communication and Support.

Nageo (Secretary) and Uyeda reported on the EMSEV membership and our attempts to generate a membership distribution that reflects the distribution of countries working in this field and not the numbers of people from particular countries. We now have 34 members representing 14 countries.

Nageo described some initial problems in setting up the email system. The EMSEV mailing list is open to everybody who sends a request to Nagao for inclusion. We now have 204 mailing list members. This system will become critically important for future EMSEV activity.

Uyeda outlined the level of support obtained so far: 1000\$ (IASPEI, used for 3rd MEEMSV), 2000\$ (IAGA) and 1000\$ (IAVCEI) for 2002. The latter two may be used for a local workshop in Manila (see below). Some similar amount of support may be expected from these associations in 2003, but not much more.

[3] Publications.

Some recent publications related to the activity of EMSEV members include: "Seismo Electromagnetics- Lithosphere-Atmosphere-Ionosphere Coupling" (Edited by M. Hayakawa and O. Molchanov), TERRAPUB., 477pp, 2002

"Recent Investigations of Electromagnetic Variations Related to Earthquakes" (Edited by S. Uyeda and S. Park), Special Issue, Journal of Geodynamics, 33, 4-5, 2002.

"A Multi-Disciplinary Study of Volcanoes" (Edited by. V. Spichak, T. Dixon and A.L. Martin), Special Issue, J. Volcanology and Geotherm Res., 113, N 1, 2002.

[4] Meetings.

Recently held meetings related to EMSEV with varied degrees were:

"International Workshop on Earthquake Precursors 2002", June 5 - 8, 2002, Taipei, Taiwan; a kick-off meeting of the new Taiwanese project "Research on Seismo-EM Precursors of Earthquakes (iSTEP)".

"16th EM Induction Workshop", IAGA Working Group 1.2, June 2002, Santa Fe, USA.
URSI General Assembly, August, 2002, Maastricht, Holland
3rd MEEMSV Workshop, Sept. 3-6, 2002, Moscow.

In near future, there are a number of meetings in which EMSEV will participate at levels ranging from major to minor. These include
Fall AGU 2002(NG06 "Scaling, Cascades, and Predictability of Earthquakes"),
EMSEV Workshop, Manila, Jan. 12-16, 2003 (see below),
3rd International Symposium on 3D EM, Adelaide, 20-21 February, 2003,
EGS/EUG/AGU (Nice), April 2003 (NH4.01 "Seismic hazard evaluation, precursory phenomena and reliability of prediction" and NH4.02 "Seismo Electromagnetics and Related Phenomena.") <http://www.copernicus.org/egsagueug/index.html>

IUGG (Sapporo), June 30-July 11, 2003, with many EMSEV related symposia as follows:

U1 Forecasting, prediction and predictability,

U4 Geophysical risk and sustainability on a crowded planet,

JSS01 Hagiwara Symp. Monitoring and modeling of earthquake and volcanic processes for prediction,

JSA 06 Seismo-, Volcano- and tectono EM effects,

JSA07 Regional crustal models based on seismic,

EM, potential field, and geothermal studies,

JSA 10 EM imaging and monitoring of volcanoes and active faults,

JWS01 Is short-term earthquake prediction possible?

GAI.09 Electrical and EM studies in geothermally active regions,

HYPERLINK "<http://www.jamstec.go.jp/jamstec-e/iugg/index.html>"

IAVCEI General Assembly, Puçon, Chile, 14-19, Nov. 2004

Deadline of proposal for symposia: End of Nov. 2002

[5] EMSEV activity in 2003-2004

5-1) Manila Workshop

The current level of support is low, but assisting developing country science is important. So, we plan to hold small scale local Mtgs. as funding permits. The first one under planning is:

"EMSEV Workshop for Initiating Seismic/Volcanic EM Monitoring in Asian Countries",
Date: Jan. 12-16, PHIVOLCS Building, Quezon City, Philippines. PHIVOLCS is willing to support this meeting by rendering meeting venue and free accommodation.

Scientific objective:

To introduce the recent progress in Seismic/Volcanic EM study to Asian scientists and to discuss the feasibility and usefulness of initiating EM monitoring in their countries.

5-2) IUGG General Assembly Sapporo, June 30-July 11, 2003

This will be an important opportunity for our activity because of many EMSEV related symposia and workshops. We plan to have a couple of EMSEV Mtgs there even if we have one Meeting in Nice, April 2003.

5-3) IAVCEI General Assembly, Chile, 2004.

We may plan some activity in association with IAVCEI General Assembly, 2004. We need to generate proposal(s) by the end of Nov. 2002. We may even plan a next local workshop in Latin America. EMSEV business meeting can be planned there, too.

5-4) There is a possibility of the 4th MEEMSV meeting in France in 2004.

[6] New Initiatives and Proposals

6-1) IGOS Geohazards initiative.

V. Tramutoli (Univ. of Basilicata, Italy) outlined a new UNESCO initiative for investigation of geohazards (earthquakes, eruptions, landslides, ground motion, etc) using a broad range of investigative techniques. The role of EMSEV appears limited in such an initiative since individual investigators would be proposing projects for funding and EMSEV could not take on this role. Its only role can be to provide a forum for discussion of results, not collection of them.

6-2) Center for EM Studies. V. Spichak (Goelectromagnetic Research Institute, Troisk) proposed the creation of a new international center for electromagnetic studies in seismically and volcanically active regions where raw data from worldwide EM projects would be sent and 3-D modelling and interpretation would be provided free of charge. Spichak requested sponsorship by EMSEV. Discussion of this proposal followed the lines that it seemed outside the primary purpose of EMSEV to take on such a role. What would we do if other groups request similar sponsorship? Rather, since the purpose of

EMSEV was to provide coordination and collaboration, taking on such a position would undermine our purpose and this would be unwise.

6-3) Sub-Working Group on Short-Term Precursors. O. A. Molchanov (Institute of Physics of the Earth, Moscow) proposed forming a sub-group for analysis of multi-parameter data that might indicate precursive behavior. However, while deriving independent constraints on the earthquake failure process from a broad range of geophysical data is important for determining the believability of the different data and understanding of the process, it seemed unnecessary to make such an organizational structure in EMSEV, which might, contrary to its intention, result in disciplinary separation rather than close interdisciplinary collaboration. Such work could better be achieved with the current simple structure.

6-4) New Journal devoted to EM phenomena.

Since many authors of papers on EM are having difficulty getting published in current international journals and in some cases have papers rejected by editors before being sent out for review, Molchanov (IPE, Moscow) proposed creation of a new journal devoted to EM phenomena associated with earthquakes and volcanoes. Discussion of this proposal took the direction that, although biased views of some editors are seriously deplorable, a new journal would probably not be a good idea since it would further isolate the field. Rather it seemed better to fight for acceptance in existing international journals by improving of the quality of the science together with integration of other geophysical data to support the reality of data and conclusions.

[7] Free discussion

Zlotnicki (IAGA-liaison member) emphasized the importance of multi-disciplinarily measurements and multi-team approaches to generate better cross-correlation of results, better evaluation of noise and ultimately more convincing EM signals. In this research area field work consists of two parts; the first focuses on obtaining knowledge of the EM structure through 3D EM imaging, and the second focuses on temporal changes to this structure using continuous monitoring of this structure with multi-disciplinary techniques in a wide spectrum of frequency. This includes ground-based electric, magnetic and EM techniques and satellite based techniques such as may soon be obtained from EM satellite platforms, such as DEMETER.

Others pointed out that careful data processing of long term data together with convincing signal to noise analysis is needed to convince the scientific community at large that abnormal variations are or are not associated with earthquakes or eruptions. During the 3rd MEEMSV meeting in Moscow (Sept. 2002) several presentations

focused on processing of combined EM and deformation data with a cross-comparison of results and implications.

Identification of the physics of EM phenomena is crucial. A consensus of participants agreed that further laboratory experiments should be promoted. At present there are relatively few and these experiments are of fundamental importance to the field. For example, only one presentation on laboratory measurements (J. Hao, China Seismological Bureau) was made during the 3rd MEEMSV meeting. The role of fluids in the rupture and eruption processes is of fundamental importance. Furthermore electrokinetic effects are often suspected to be one of the primary physical mechanisms generating EM signals.

There were suggestions that we should 1) focus on international, multi-disciplinary experiments at a few selected sites, where all the skills of different teams to perform 3D tomography, data acquisition and analysis, relevant laboratory experiments, physics analysis, and modelling can be applied, and 2) make efforts to enlist the cooperation of other geophysical disciplines (i.e. seismology, ground deformation, geochemistry, hydrology ..) in order to produce better understanding and integration of the results and a more efficient analysis of phenomena related to earthquakes and volcanic events.

Meeting adjourned at 18:00, with a final remark of Uyeda that the Meeting was useful in clarifying the purpose of the nature of EMSEV and in deliberating our future activity. It was a satisfying start of a working group, which is composed of members with varied backgrounds working on a new, yet un-established scientific discipline.