

# **17th Business Meeting of IASPEI/IAGA/IAVCEI Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV)**

**September 25, 2014, Konstancin, Poland**

## **1) Participants**

### **Bureau Members (\*Attended Business Meeting)**

- \*ZLOTNICKI, Jacques (Chairperson, CNRS, France)**
- \*JOHNSTON, Malcolm (Vice Chairperson, IASPEI liaison member, USGS, USA)**
- \*NAGAO, Toshiyasu (Secretary, Tokai Univ., Japan)**
- \*SASAI, Yoichi (IAVCEI liaison member, Tokai Univ., Japan)**
- \*LIU, Jan Yenq. (IAGA liaison member, Taiwan)**
- \*SINGH, Ramesh (Chapman Univ., USA/India)**
- \*UYEDA, Seiya (EMSEV past chairperson)**

### **Country Representatives and EMSEV Members (\*Attended Business Meeting)**

#### **BELGIUM**

- \*BERNARD, Alain (Université Libre de Bruxelles, Belgium)**

#### **CHINA**

- \*HUANG, Qinghua (Peking University, China)**
- XUEBIN, Du (Lanzhou Inst. Seismology, China)**
- ZHANGHUI, An (Lanzhou Inst. Seismology, China)**
- SHEN, Xuhui (Chinese Earthquake Administration, China)**
- LOU, Wenyu (Chinese Earthquake Administration, China)**
- ZHANG, Xuemin (Chinese Earthquake Administration, China)**

#### **GREECE**

- \*VAROTSOS, Panayiotis (Univ. Athens, Greece)**
- \*SARLIS, Nick (Univ. Athens, Greece)**
- ANAGNOSTOPOULOS, G. (Space Science Lab., Greece)**
- \*VARGEMZIS, George (University of Thessaloniki, Greece)**
- DOLOGLOU, E. (Univ. Athens, Greece)**

#### **ITALY**

- \*BIAGI, Pier Francesco (Univ. Bari, Italy)**
- \*ERMINI, Anita (Univ. Tor Vergata - ROMA, Italy)**
- \*TRAMUTOLI, Valerio (Univ. Basilicata, Italy)**
- CURRENTI, Gilda (Istituto Nazionale di Geofisica e Vulcanologia, Italy)**
- NAPOLI, R (Istituto Nazionale di Geofisica e Vulcanologia, Italy)**
- \*PIRODDI, Luca (Univ. Cagliari, Italy)**
- \*LISI, Mariano (CNR, Italy)**

**INDIA**

**CHOUDHARY, S. (AISECT University, India)**

**JAPAN**

**KUMAGAI, Hiroyuki (Nagoya University, Japan)**

**KOREA**

**RYU, K. (Satellite Technology Res. Center), Korea**

**KYRGYZ**

**\*VORONTSOVA, Ekaterina (Research Station of RAS, Kyrgyz)**

**LUXEMBURG**

**\*MOSER, Hubert (LuxSpace Sarl, Luxemburg)**

**RUY, Ghislain (LuxSpace Sarl, Luxemburg)**

**MEXICO**

**CERVANTES DE LA TORRE, Francisco (UAM-AZCAPOTZALCO, Mexico)**

**REAL-RAMIREZ, Cesar (UAM, Mexico)**

**POLAND**

**\*BLECKI, Jan (Space Research Centre, Poland)**

**TEISSEYRE, Roman (Polish Academy of Sciences, Poland)**

**TEISSEYRE, Krzysztof (Polish Academy of Sciences, Poland)**

**DEBSKI, Wojciech (Polish Academy of Sciences, Poland)**

**STANISLAWSKA, I. ((Space Research Centre, Poland)**

**SEMENOV, V.Y. (Polish Academy of Sciences, Poland)**

**ERNST, Tomasz (Polish Academy of Sciences, Poland)**

**JOZWIAK, Waldemar (Polish Academy of Sciences, Poland)**

**KOSCIENZA, Malgorzata (Polish Academy of Sciences, Poland)**

**WRONOWSKI, Roman (Space Research Centre, Poland)**

**ROMANIA**

**\*STANICA, Dimitru (Romanian Academy, Romania)**

**\*TOADER, Victorin-Emilian (National Institute for Earth Physics, Romania)**

**MOLDOVAN, IREN (National Inst. For Earth Physics, Romania)**

**CONSTANTIN, Petruta (National Inst. For Earth Physics, Romania)**

**RUSSIA**

**\*PULINETS, Sergey (Space Research Inst., Moscow, Russia)**

**\*KOSSOBOKOV, Vladimir (Russian Acad. Sci., Russia)**

**\*KOPYTENKO, Y.A. (SPbF IZMIRAN, Russia)**

**\*YAGOVA, Nadezda (Russian Acad. Sci., Russia)**

**SOROKIN, V.M. (Russian Acad. Sci., Russia)**

**TAIWAN**

**LEE, Chao Shing (Inst. Applied Geoscience, Taiwan)**

**TSAI, Ho-Fang (National Central University, Taiwan)**

**UKRAINE**

**\*ROKITYANSKY, Igor (Inst. Geophysics NAS, Ukraine)**

**\*RAPOPORT, Yu. G. (Kyiv National Taras Shevchenko University, Ukraine)**

**USA**

**\*VANDERBILT, Vern**

## 2) Opening Remarks: Zlotnicki : Chair

Jacques Zlotnicki opened the meeting by thanking our Polish hosts, particularly Jan Blecki and the Local Organizing Committee, for setting up such a successful meeting in such a beautiful setting. We had about 60 participants from 16 countries who presented their latest results and debated many issues related to electromagnetic and other geophysical signals that occur with earthquakes and volcanic eruptions. Jacques then summarized the history of EMSEV from its beginning at the 1999 IUGG meeting in Birmingham, UK and its relationship to IAGA, IAVCEI and IASPEI Associations that form part of IUGG. EMSEV in 2014 has evolved into a much more transverse working groups with a strong emphasis on the importance of integration of EM data with seismic, deformation, hydrologic, geochemical and other geophysical data.

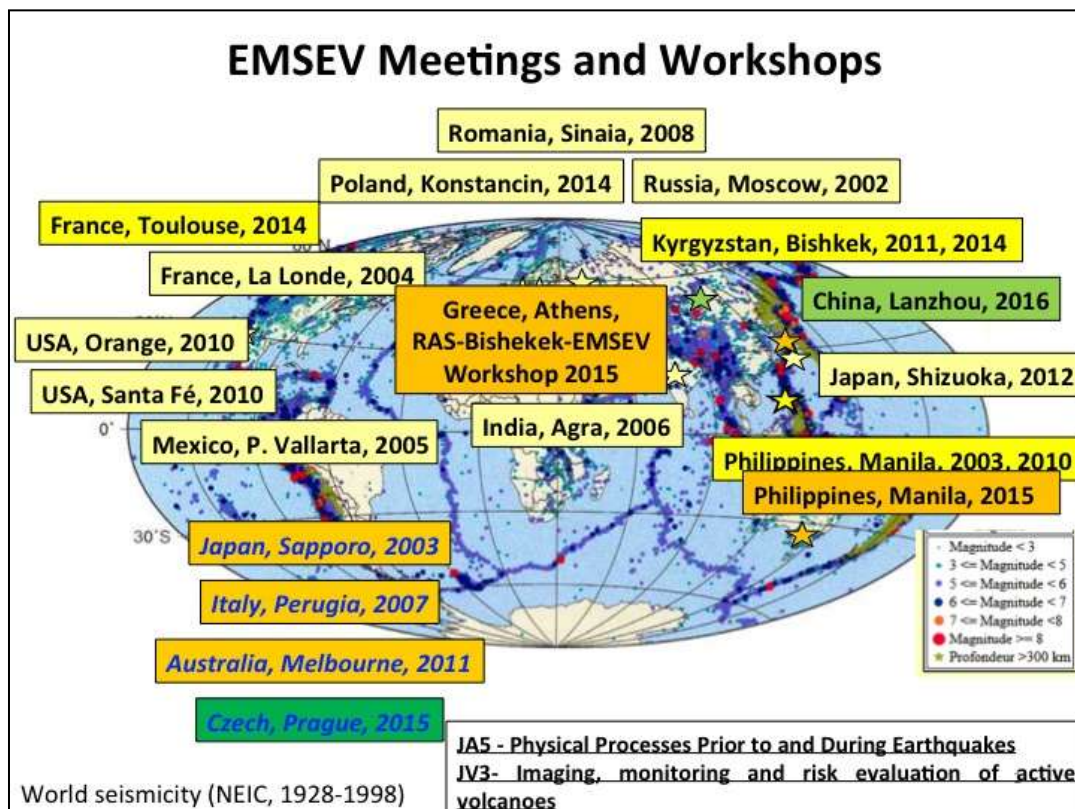
The organization of EMSEV is composed of

- An Executive Bureau (consisting of 12 researchers elected to 4-years terms). A new Bureau will be formed at IUGG2015,
- A nominated assembly of 32 Working Group Members representing 16 different countries,
- Other Working members who are scientists contributing to EMSEV activities and primary working on electromagnetic effects in Natural Hazards,
- Corresponding Members who are a community of researchers who are interested in electromagnetic phenomena,
- EMSEV collaborators who are scientists from other fields of geophysics contributing to EMSEV activities while working in related fields of research (e.g. seismology, geochemistry, geodesy, hydrology, etc)

In total, more than 300 scientists are involved in EMSEV activities.

Because of the breadth of this interest many EMSEV sponsored meetings have been organized since the formation of EMSEV in 2001. Figure 1 shows the location of these meetings together with future meetings at the IUGG in 2015 (dark green) and in Lanzhou, China in 2016 (light green).

In addition, EMSEV members are largely involved in the organization of specialized sessions at IAGA, IAVCEI and IASPEI General Assemblies, as well as in other International meetings as AGU, EGU, AOGS, URSI, COV ...



Sessions at the EMSEV2014 were as follows:

- Introductory Session chaired by Roman Teisseyre
- Physics and Observations of Earthquake Preparatory Processes chaired by Jan Blecki
- Constraints from Seismology, Geodesy and Other Geophysical Techniques chaired by Malcolm Johnston
- Electrodynamics in Solids and Rock Materials – Theory and Laboratory Results chaired by Sergey Pulinet
- Related Electromagnetic Signals and Other Physical Parameters to Earthquakes – Ground Base and Satellite Observations chaired by Toshi Nagao
- Related Electromagnetic Signals and Other Physical Parameters to Volcanoes, Geothermal Fields and Landslides – Ground Base and Satellite Measurements chaired by Jacques Zlotnicki
- Signal Recognition, Data Processing and Modeling Chaired by Wojciech Debski
- Poster session covering all the above areas chaired by Valerio Tramutoli
- Future Experiments, Missions and Theoretical Developments chaired by Yoichi Sasai

### 3) Publication of Proceeding of EMSEV2014

Jan Blecki proposed that papers from the meeting should be published either in Acta Geophysica or in a special Meeting Monograph probably through Springer. The general

consensus or preference was to try for Acta Geophysica. Panayotis Varotsos voted for Acta Geophysica particularly since Roman Teisseyre was the editor for many years. Sergey Pulinets suggested that the presentations should also be available on the web. Toshi Nageo suggested that they should be on the EMSEV web site. Jacques Zlotnicki suggested that an email should be sent to all participants asking for permission to put individual presentations on the web and whether the authors were willing to submit a paper to Acta Geophysica. Jan Blecki agreed to send out such a memo.

#### **4) New Collaborators:**

Because of the overlap of EMSEV activities into many other fields of geophysics it was proposed that collaborators in a number of these fields should be encouraged. In particular, the fields of

- [1] Atmospheric physics
- [2] Hydrology
- [3] Atmospheric electricity

were identified as ones in which expert discussion would be productive when trying to understand atmospheric-ionospheric coupling, electromagnetic effects related to fluid flow and electrical charge generation and retention in the atmosphere.

#### **5) EMSEV Activity in Developing Countries.**

##### **[a] EMSEV activity related to Volcanoes**

EMSEV formed 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. Many different data are currently being sent in real-time to France, Japan and the USA. These data are being used to attempt improved understanding of episodes of volcanic unrest such as occurred in May-July, 2010. Reduction of these data and their implications will be presented at:

**ASC 2014 meeting in Manila: Nov. 2014**

**IUGG 2015 in Prague principally is Symposia JA5 and JV3**

**2015-2016, EMSEV-PHIVOLCS Workshop.**

At this meeting a new cooperative agreement covering the next 5 years should be signed.

## **[b] EMSEV activity related to Earthquakes**

In 2011, the EMSEV working group started a new research effort focused on understanding fault failure and the mechanisms of earthquakes. We develop 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 with earthquakes has been in process during the last 30 years. A cooperative agreement between EMSEV and the Bishkek Research Station was signed in November, 2011 for a 4 year period. A new agreement should be signed in 2015.

The Bishkek Research Station has a very advanced system set up using huge electrical current systems that are able to inject more than 800 A along 4.5 km long electrical lines. These can be used for monitoring:

[1] The changes of the electrical resistivity of the ground in relation crustal stress changes and regional seismicity.

[2] The effects of large currents injection on the induced local seismicity. If successful, this may point to a way of controlling earthquakes.

## **6) Next EMSEV Meeting (EMSEV2016)**

The offer by the Lanzhou Institute of Seismology, China Earthquake Administration, China, to host the next EMSEV meeting in 2016 was presented by Professor Xuebin Du. This offer was accepted.

## **7) Report of EMSEV Meeting Activities:**

### **a) 2014-15 activities**

EMSEV will be involved in several international meetings in 2014-2015. Many participants are expected at the December Fall AGU meeting at San Francisco, the EGU (European Geosciences Union) on April 17-17, 2015 and the IUGG 2015 General assembly in Prague (Czech Republic June 22 to July 2, 2015).

The list of main meetings is as follows:

#### ***AGU, San Francisco, USA, December 2014***

- NH001: International Collaborations for Monitoring of Multiple Electromagnetic Pre-Earthquake Signals

-NH010: Interdisciplinary study of pre-earthquake processes: Observation, validation, modeling, and forecasting

-NH018: Seismology without Seismometers: Ionospheric Monitoring of Natural Hazards of Earth, Ocean, and Atmosphere

-NH016: Remote Sensing and New Technologies in Monitoring, Modeling and Early Warning of Natural Hazards

### ***EGU, Vienna, 12-17 April, 2015***

• NH4.3/SM3.1: Earthquakes Short-term Prediction and time-Dependent Assessment of Seismic Hazard Convener: Valerio Tramutoli, Co-Conveners: Pier Francesco Biagi, Gerassimos Papadopoulos, Jann-Yeng Tiger Liu, Dimitar Ouzounov, Sergey Pulinets, Masashi Hayakawa, Vladimir Kossobokov, Giovanni Martinelli

### ***IUGG2015, 22 June – 2 July 2015, Prague, Czech Republic***

Two joint sessions were organized by EMSEV

• JA5: Physical Processes Prior to and During Earthquakes, Reliability of Precursors (IAGA, IASPEI, IAVCEI)

Lead Convener: Elvira Astafyeva, Paris, France (IAGA), Co-conveners: Jacques Zlotnicki, Clermont Ferrand, France (IAVCEI), George Balasis, Athens, Greece (IAGA); Jan Blecki, Warsaw, Poland (IAGA); Malcolm Johnston, Menlo Park, USA (IASPEI); Valerio Tramutoli, Potenza, Italy (IASPEI); Takeshi Hashimoto, Sapporo, Japan (IAVCEI)

• JV3: Geophysical Imaging and Monitoring of Volcanoes (IAVCEI, IASPEI, IAGA)

Lead Convener: Jacques Zlotnicki, Clermont Ferrand, France (IAVCEI), Co-conveners: Yoichi Sasai, Shizuoka, Japan (IAGA); Malcolm Johnston, Menlo Park, USA (IASPEI); Gilda Currenti, Catania, Italy (IAVCEI); Boris Levin, Yuzhno-Sakhalinsk, Russia (IAPSO)

## **8) EMSEV budget**

### **1- EMSEV-RAS BISHKEK RS 2014 Workshop (March 2014, Toulouse, France)**

The organization of the workshop has cost 3360 €. Budget was taken on 2013 incomes.

Three researchers from Kyrgyzstan, and Greece were supported (flight and stay), and EMSEV took in charge the Workshop organization.

### **2- EMSEV 2014 budget**

#### ***Incomes***

Origin		Amount (€)
IAVCEI	3000 €	3000 €
IAGA	1000 \$	770 €
IASPEI	1000 \$	770 €
Total		4540 €

### *Outgoing costs*

Origin		Amount (€)
Toulouse EMSEV-BIshkek Workshop		-260
Supports to participants to EMSEV 2014 meeting		-1600
Support to EMSEV meeting		-400
Provision for Taal field works		-2000

The remaining budget for 2014 income is 280 €

### **9) Thanks**

Toshi Nagao Thanks the LOC especially Jan Blecki for a very successful and well organized meeting.

The Meeting was adjourned by Jacques Zlotnicki who thanked everyone for their attendance and their lively discussions.

