

# **18th Business Meeting of IASPEI/IAGA/IAVCEI Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV)**

**June 26, 2015, IUGG2015, Prague, Czech Republic**

## **1) Participants**

### **Bureau Members**

**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)**  
**HUANG, Qinghua (Peking University, China)**  
**KOREPANOV, Valery (ISR, LVIV, Ukraine)**

### **Participants (\* EMSEV-WG member)**

#### **EGYPT**

**GAD, El-Cady (NRIAG, Egypt)**

#### **GREECE**

**SARLIS\*, Nicholas (Univ. Athens, Greece)**

#### **ITALY**

**TRAMUTOLI\*, Valerio (Univ. Basilicata, Italy)**  
**LAPENNA\*, VINCENZO (Nat. Res. Council, Italy)**  
**CURRENTI, Gilda (Istituto Nazionale di Geofisica e Vulcanologia, Italy)**  
**DESANTIS, Angelo (Istituto Nazionale di Geofisica e Vulcanologia, Italy)**  
**NAPOLI, R (Istituto Nazionale di Geofisica e Vulcanologia, Italy)**  
**PERGOLA, Nicola (Univ. Basilicata, Italy)**

#### **INDIA**

**VEERASWAMY, K. (CSIR – NGRI, India)**  
**BANSAL, B, K., (Min. Earth Sciences, India)**

#### **JAPAN**

**HASHIMOTO, Takesi (Hokkaido University, Japan)**  
**TSUTSUI, Minoni (Kyoti Univ., Japan)**  
**MOGI, Toru (Hokkaido University, Japan)**  
**SHO, Marita (Hokkaido University, Japan)**

**KYRGYZ****RYBIN\*, Anatoly (Research Station of RAS, Kyrgyz)****PROMENKO, Vira (Research Station of RAS, Kyrgyz)****POLAND****BLECKI\*, Jan (Space Research Centre, Poland)****DELOSKI, Wojcevidi (IGF, Polish Academy of Sciences, Poland)****ROMANIA****STANICA\*, Dimitru (Romanian Academy, Romania)****RUSSIA****LUKIANOVA, Renata, (GERAS, Russia)****ZEIGARNIK, Vladimir (JIHT, Russia)****UKRAINE****PRONENKO, Vira (ISR, LIVI, Ukraine)****2) Opening Remarks: Zlotnicki : Chair**

Jacques Zlotnicki opened the meeting by summarizing the structure of EMSEV within IUGG and the three associations, IASPEI, IAVCEI and IAGA. EMSEV is currently well recognized within all three associations for international field activities and its efforts at bringing together scientists from diverse fields of geophysics. Under the EMSEV umbrella many papers have been written, one PhD has been obtained and cooperative programs have been set up in the Philippines and in Kyrgyz. In both locations, instruments have been installed by EMSEV teams through international cooperation's and Memorandum of Agreements, data analyzed and results presented at various meetings. Eighteen EMSEV workshops and/or meeting have been held since the inception of EMSEV in 2001. All this has resulted in very good reports from IUGG and the associations. At the current IUGG meeting, two symposia JA05 on "Physical Processes Prior to and During Earthquakes, Reliability of Precursors" and JV3 on "Imaging, Monitoring and Risk Evaluation of Active Volcanoes" were organized by EMSEV. This involved eight individual oral sessions and two poster sessions. At these sessions, 71 papers were presented. Jacques then summarized the structure of EMSEV and the fact that every four years the EMSEV Bureau (12 researchers) and Membership (32 researchers with approximately two persons per country) is rotated provided willing and suitable candidates who can actively participate in EMSEV can be found among the more than 300 scientists who are currently participants in EMSEV. In particular, Jacques requested that he should be replaced in the next two years. Yoichi Sasai and Malcolm Johnston also requested replacement. Sasai suggested that he should be replaced by Takeshi Hashimoto. It was accepted by the attendees, although it was agreed that Sasai would help support Hashimoto's task during the next few years. Jacques also proposed that Gilda Currenti from Italy should be involved in the bureau in order to take part in the EMSEV management in the next future. Jacques then opened the floor for proposals regarding possible candidates to replace Members and the Bureau, particularly those who have not actively participated in the past four years.

**3) Proposals for Member and Bureau Replacement**

During the past few years, it has become apparent that several key EMSEV positions should be replaced by new researchers willing to seriously help in the promotion and the development of EMSEV activities. Many ad hoc proposals for replacement of Members and Bureau were made from the floor. Such an issue should be managed with care taking into account the right balance between the large number of disciplines involved in research on earthquakes, active volcanoes, geothermal fields, and so forth, from the nucleation source in the crust to the effects into the ionosphere. A good representation of the international community working on electromagnetism and other geophysical methods has also to be maintained. Therefore, it seems more important to pursue the following guidelines:

- In the next few months, all possible vacant positions will be defined after discussion with those stepping down and those who have positions but have not actively participated in EMSEV,
- A letter will be sent to all participants in EMSEV soliciting proposals for new candidates for each vacant position,
- The nominations for each positions will be listed, and final voting will be organized in agreement with EMSEV' scope and IUGG requirements for Inter-Associations working groups.

#### 4) EMSEV 2015 Budget:

##### *Incoming*

Origin		Amount (€)
IAVCEI	1000 €	1000 €
IAGA	\$1000	838 €
IASPEI	\$1000	838 €
Carry Forward		280 €
Total		2956 €

##### *Outgoing*

[1] June 2015 (IUGG and EMSEV posters): 120 €

[2] Budget Planning

**Remaining budget (June 26, 2015): 2836 €**

Proposed Outgoing	Amount (€)
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Taal field work November 2015 [Support for repairing lightning damage, tiltmeters installation, infrastructure ....]	1000
Partial support for inviting E. Vorontsova in Japan [EMSEV - Bishkek cooperation]	400
Support for 2016 EMSEV meeting in Lanzhou, China [Preparation visit scheduled in September 2015]	400
Barcelona IAPSEI-IAVCEI meeting Nov. 24-26, 2015 (EMSEV participation): "Earthquakes and Volcanoes: Causes and effect relationships"	500
Small workshop on EMSEV-PHIVOLCS activities in the Philippines in Toulouse at the time of 2015 Barcelona Meeting or during spring 2016 (after new data collection) [Philippines, Japan, USA, Belgium, Italy, France ...]	500
Total	2800 €

**Remaining budget: 36 €**

**5) EMSEV Activity in Countries interested in developing EM and other geophysical studies in earthquake and volcano prone areas.**

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

EMSEV formed a co-operative program with Philippines Institute of Volcanology and Seismology (PHIVOLCS), on Taal volcano in November 2004 (<http://www.phivolcs.dost.gov.ph/>). At present, this international cooperation involves foreign 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 were presented at IUGG 2015 in Prague principally in Symposia JA5 and JV3. Information is regularly distributed to PHIVOLCS and EMSEV. In the framework of this cooperation, a young Filipino scientist got his Phd at Tokai University in 2015.

**2015-2016, EMSEV-PHIVOLCS activities.** New field work, data analysis and workshops are scheduled. 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 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 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 has been signed in 2015. A new effort is planned in 2016 for developing joint field work and data analysis.

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 to crustal stress changes and regional seismicity.

[2] The effects of large current 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. It has been accepted and basic organizational details will be jointly be discussed at a meeting in Lanzhou Institute with J. Zlotnicki, T. Nagao, Q. Huang, and T.Liu in Lanzhou and Beijing in September 2015.

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

### **a) Late 2014-2015 activities**

EMSEV was involved in several international meetings. The list of main meetings in late 2014 and 2015 are 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 2011, 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 (IASPEI)

**b) 2015-2016 activities**

EMSEV will be involved in:

**IASPEI/IAVCEI Meeting Barcelona, Spain on November 24-26, 2015**

The scope is to discuss on "Earthquakes and Volcanoes: Cause and effect relationships"

**EMSEV – Philippines Meeting, Toulouse, France, November 2015 or Spring 2016**

The objective is to gather the main participants in the activities on Taal volcano including PHIVOLCS members. A French budget is devoted to that on the 2015-June 2016 Bio-Asia project.

**AGU, San Francisco, USA, December 2015**

-NH13: Remote Sensing and New Technologies in Monitoring, Modeling, and Early Warning of Natural Hazards

- NH014: Satellite Remote Sensing and Management of Natural Disasters

-NH021: Interdisciplinary Study of Pre-earthquake Processes: Observation, Validation, Modeling, and Forecasting

-NH031: International Collaborations for Monitoring of Multiple Electromagnetic Pre-earthquake Signals

-NH033: Seismology without Seismometers: Ionospheric Monitoring of Natural Hazards of Earth, Ocean, and Atmosphere

**EGU, Vienna, 17-22 April 2016**

-Sessions at Proposal Stage

**EMSEV Meeting at Lanzhou, Gansu Province, China**

-Sessions and timetable will be defined in September 2015 after the preliminary visit.

**8) Meeting Adjournment**

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