

Minutes of the 20th Business Meeting of the IUGG (IASPEI/IAGA/IAVCEI) Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV)

The session was opened by Toshiyasu Nagao (TN), EMSEV new Chair, who summarized the items on the agenda. The business meeting was relatively short because of the time available (60 minutes). There were 17 Bureau members, Country Liaisons and regular Members present.

Date: July 15, 2019

Place: Montreal IUGG-GA room 523A (IASPEI office)

Time: 12:00-13:00

1. Opening remarks (TN)

In his opening remarks, TN pointed out that EMSEV is very well recognized by IUGG and many associations with very relevant ongoing communications with both IUGG and the associations regarding what we are doing and where we are doing.

This is very important in that it facilitates ongoing planning for meetings and field activities. IUGG is grateful for our work and appreciates the acknowledgements of its role in the various publications produced. Funding from IUGG has continued and we have had good feedback.

EMSEV develops field and research activities through international cooperation with host countries (Philippines, Kyrgyz). It clearly benefits all participants and contributes to approach more deeply the physics of earthquakes and the genesis of volcanic eruptions.

TN mentioned about the current status of EMSEV structures, members, website, etc., as follows:

The last couple of years, EMSEV used the word of "National representatives". However, this terminology is rather strict. Therefore, after the 2018 Potenza meeting, we changed "National representatives" to "Country liaisons". Furthermore, we clarified that the definition of "EMSEV members" as follows: "The definition of EMSEV Member is anyone who has an interest or who participates in EMSEV activities".

Current EMSEV structure (as of July 15, 2019):

EMSEV Bureau (15 members from 10 countries)

EMSEV Country Liaisons (including bureau members: 36 from 16 countries)

EMSEV Members (351 members in the mailing list)

EMSEV Collaborators (Two colleagues from two countries (Russia and Belgium))

2. EMSEV activities 2018

EMSEV participated and organized the following meetings/sessions.

April 8-13, 2018: EGU, Vienna, Austria

NH4.5/EMRP4.27/SM3.03 Short-term Earthquakes Forecast (StEF) and multi-parametric time-Dependent Assessment of Seismic Hazard (t-DASH) (Co-sponsored by JpGU) (co-organized)

Convener: Valerio Tramutoli, Co-Conveners: Pier Francesco Biagi, Katsumi Hattori, Jann-Yenq Liu,

Giovanni Martinelli, Gerasimos Papadopoulos, Michel Parrot, Sergey Pulnits, Filippos Vallianatos

May 12-14, 2018: International Conference for the Decade Memory of the Wenchuan Earthquake with the 4th International Conference on Continental earthquakes (<http://www.4thicce.com/>). Chengdu, China

During the meeting, EMSEV and Institute of Crustal Dynamics, CEA signed the MOU concerning mainly on the CSES data handling.

May 20-24, 2018: JpGU-AGU Joint 2018, Chiba, Japan

M-IS03, Interdisciplinary studies on pre-earthquake processes, conveners: Katsumi Hattori, Jann-Yenq Liu, Dimitar Ouzounov, Qinghua Huang, co-sponsored by AGU, AOGS and EGU.

May 25-27, 2018: ISEF/IWEP5 (International Symposium on Earthquake Forecast/5th International

Workshop on Earthquake Preparation Process), Chiba, Japan (co-sponsored: Earthquake Research Institute, the University of Tokyo, Chiba University, Tokai University, National Central University, Chapman University)

June 3-8, 2018: AOGS, Honolulu Hawaii, USA

IG22, Pre-earthquake Anomalies, Earthquake Predictability, 10 Years Commemoration 2008 M8.0 Weichuan Earthquake, Kickoff Chinese Seismo-electromagnetic Satellite, Conveners: Jann-Yenq (Tiger), Katsumi Hattori, Dimitar Ouzounov

Sept. 17-21, 2018: EMSEV2018 in Potenza, Italy

This was EMSEV biennial meeting. This workshop was supported by IUGG, IAGA, IAVCEI and IASPEI Associations, and was hosted by the University of Basilicata and the Institute of Methodologies for Environmental Analysis of the Italian National Research Council with the strong support of the National Institute of Geophysics and Volcanology. Professor Valerio Tramutoli in association with Professor Nicola Pergola efficiently organized the four days meeting with a powerful local organizing committee. EMSEV 2018 was successfully held, i.e. more than 110 participants from 25 different countries coming from 4 continents and presented their most up-to-date results in oral presentations and with posters.

Nov. 16-18, 3rd CSES satellite workshop, Beijing, China

This meeting was the first meeting after the signing of MOU (between CEA and EMSEV), some EMSEV bureau and country liaison members attended the meeting and obtained the sample data.

Dec. 10-14, 2018: AGU Fall meeting, Washington DC, USA

NH11A, Pre-Earthquake Processes: A Multidisciplinary Approach to Earthquake Prediction Studies, Conveners: Dimitar Ouzounov, Patrick Taylor, Katsumi Hattori, Sergey Pulinets (co-sponsored: JpGU)

Furthermore, EMSEV country liaisons and bureau members enthusiastically attended the following meetings.

February 4-8, 2018, AOGS-EGU, New dimension for Natural Hazards in Asia, Tagaytay, Philippines

June 17-22, 2018: ICAE2018 (The 16th International Conference on Atmospheric Electricity), Nara, Japan

3. EMSEV activities 2019 and 2020

April 7-12, 2019: EGU, Vienna, Austria

NH4.3: Short-term Earthquakes Forecast (StEF) and multi-parametric time-Dependent Assessment of Seismic Hazard (t-DASH)

Co-organized as AS4.62/EMRP2.40/ESSI1.7/GI2.13/SM3.9, co-sponsored by JpGU

Convener: Valerio Tramutoli | Co-conveners: Mariano Lisi, Pier Francesco Biagi, Katsumi Hattori, Filippos Vallianatos

May 26-30, 2019: JpGU, Chiba, Japan

M-IS04, Interdisciplinary studies on pre-earthquake processes, Conveners: K. Hattori, J. Y. Liu, D. Ouzounov, Q. Huang,

May 31-June 1, 2019: IWEP6, Chiba, Japan

6th International Workshop on Earthquake Preparation Process), Chiba, Japan (co-sponsored: Chiba University, Tokai University, National Central University, Chapman University)

July 8-18, 2019: IUGG GA, Montreal, Canada

S15, Interdisciplinary Observations of Pre-Earthquake Processes: A New Approach Towards Earthquake Prediction Studies, Convener: Dimitar Ouzounov, Co-Conveners: Sergey Pulinets, Katsumi Hattori, Patrick Taylor

JA10, Electromagnetic Signals Generated by Volcanic Eruption/Activity, Fluid Pressure, Earthquakes and Aseismic Fault Slip (IAGA, IAVCEI, IASPEI), Convener: Jacques Zlotnicki (IAGA),

Co-Conveners: Malcolm Johnston (IAGA/IASPEI), Takeshi Hashimoto (IASPEI/IAVCEI), Xuhui Shen (IASPEI), Yoichi Sasai (IAVCEI)

Oct. 17-20, 2019: The 4th International Workshop of CSES Mission, Changsha, China
<http://geohazard-cses-2019.com/>

Dec. 9-13, 2019: AGU Fall meeting, San Francisco, USA

NH029 - Multi-sensor observations of pre-earthquake signals, geo-hazards, and space weather from space and ground observations, Conveners: Dimitar Ouzounov, Tiger Liu, Livio Conti, Patrick Taylor

May 3-8, 2020: EGU, Vienna, Austria

As for the past years, EMSEV members will propose different sessions on EM signals related to natural Hazards.

May 10-12, 2020: Sofia, Bulgaria

The International Symposium “Pre-earthquake Processes and Earthquake Prediction” is going to be held in Sofia, Bulgaria on May 10-12, 2020. The host of the meeting is the National Institute in Geophysics, Geodesy, and Geography (NIGGG), Academia of Sciences. Initially, this meeting was proposed as a session on Balkan Geophysical society organized for this September in Bulgaria. Because of the high interest was decided to be planed as a separate event. NIGGG team is running a national project studying the pre-earthquakes processes and supports this topic. The proposed meeting is first of this kind in Europe and Balkans and will bring scientist from Greece, Romania, Serbia, Macedonia, Turkey, Ukraine, Italy, Russia. So this meeting is not only addressed to Bulgarian seismic study but also more widen area. Therefore, EMSEV supports this meeting.

May 23-27, 2020, Cities on Volcanoes 11, Heraklion (Crete, Greece)

<https://www.iavceivolcano.org/40-featured-articles/132-cities-on-volcanoes-11-heraklion-23-27-may-2020-first-circular.html>

This meeting is co-organized y IAVCEI and EMSEV participants will take part to this meeting

The first circular in now available:

https://www.iavceivolcano.org/downloads/news/2019/COV11/COV11_1st_Circular.pdf

May 24-28, 2020, JpGU, Chiba, Japan

May 29-30, 2020, IWEP7, Chiba, Japan (Planned)

June 2020, The Eighth International Symposium “Problems of Geodynamics and Geoecology of International Orogens”, Bishkek, Kyrgyz (Planned)

August 24-28, 2020, EMSEV2020, Taipei, Taiwan

This is EMSEV biennial meeting. We decided EMSEV2020 will be held in Taiwan during EMSEV2018. Professor J. Y. Liu will be the chair of the Local Organizing Committee. Now the meeting date is fixed.

4. General Discussion

Concerning the EMSEV budget during FY2019, EMSEV received \$3,000.- from IUGG. Basically, we have to use this amount before the 2020 budget. Therefore, EMSEV would like to support AGU fall meeting, scheduled Taal fieldwork in September 2019 and participants to international meetings (see below).

EMSEV activities on Taal and Kyrgyz still need to be supported in the next future.

On Taal, EMSEV still continue to develop electromagnetic (EM) studies at the regional scale (i.e. magnetotellurics). In the meantime EMSEV deeply encourage the young EM Filipinos group from PHIVOLCS to take the head of the volcano monitoring.

In Kyrgyz, EMSEV has two electric stations in operation which are included in the frame of the different networks managed by Bishkek Research station from the Russian Academy of Science. These stations have to be maintained and updated. Two EMSEV papers were already written and some new studies are in course. Published joint papers are:

Sarlis, N. A., P. Varotsos, E. Skordas, S. Uyeda, J. Zlotnicki, T. Nagao, A.S. Rybin, M.

Lazaridou-Varotsos, K. Papadopoulou, Seismic electric signals in seismic prone areas, *Earthquake Science*, 2018, 31, 44–51, 2018.

Papadopoulou, K., E. Skordas, J. Zlotnicki, T. Nagao and A. Rybin, Study of Geo-Electric Data Collected by the Joint EMSEV-Bishkek RS-RAS Cooperation: Possible Earthquake Precursors, *Entropy*, 20(8), 614; <https://doi.org/10.3390/e20080614>, 2018.

Unfortunately, Kyrgyz country liaison member of Dr. A. Rybin could not attend the business meeting, however, during the IUGG-GA, we were able to discuss this issue and each party confirmed its strong interest in the continuation of the cooperation.

In 2020, Bishkek Research station will organize a new international meeting in Kyrgyz and EMSEV will take this opportunity for taking part to this important event and for making a new step in the data analysis with Russian and Kyrgyz colleagues.

Furthermore, EMSEV turns to support additional volcano monitoring project.

- One of the projects could be based on the huge key electromagnetic results obtained on Mount Etna by INGV-Catania group. INGV maintains and monitors Etna since decades and outstanding results should be more highlighted and compared with results obtained on other similar volcanoes. In addition, one electric-magnetic French station set in cooperation with INGV (R. Napoli, G. Currenti) is operating on the top of the volcano (when not hitting by lightning's) and deep data analysis should be performed in comparison with magma ascent, plumes emission, ground deformation, etc. This low-cost project could be endorsed by EMSEV.

- Another issue could be considered: the renew of activity of Soufrière of Guadeloupe in the Lesser Antilles Arc. Since 1992, the volcano has showed an increase of surface and degassing activity has strongly emphasized since 2016. It would be a powerful insight that EMSEV community focuses satellite observations on this volcano. It could take advantage of ground observations made since the last 1976-1977 volcanic crisis.

New proposal:

M. Kamogawa introduced the current Mt. Fuji research. Kamogawa and his group are now operating NPO (Non-Profit Organization) of Mt. Fuji Research Station at the summit. Mt. Fuji is the highest mountain in Japan (3776m). The most notable feature of this mountain is an isolated and active volcano. The mount Fuji's last eruption was 1707, therefore next eruption is really a key to Japanese society. At the summit of Mt. Fuji, no magnetic survey is operated. So, we would like to start a total magnetic survey at the beginning.

EMSEV WEB modification:

In the future, papers directly related to the EMSEV activities (Taal, Bishkek etc.) will be listed on the EMSEV website.

New country liaison member:

At this moment, EMSEV has 36 bureau and country liaison members, we have to update the list as much as possible. Dr. Zlotnicki proposed new country liaison member from India (Brijesh K Bansal, Adviser and Head (Geosciences/Seismology), Ministry of Earth Sciences, New Delhi, India). This proposal was adopted unanimously.

5. Summary of EMSEV future activities:

J. Y. Liu officially informed us the date of EMSEV 2020 in Taiwan is August 24-28, 2020. This is the most important EMSEV activity in 2020.

EMSEV will participate to most of the 2020 International meetings (EGU, JpGU, IWSEP7, CoV11.)

Taal project was started at the very beginning of the EMSEV initiation. Taal Volcano is well recognized “Decade Volcano” defined by IAVCEI. However, the last eruption was in 1977. Recently, Taal Volcano is getting active. Therefore, we will continue cooperation a little bit more.

Concerning the Kyrgyz project, we decided to continue cooperation in the next years.

EMSEV will promote cooperation on “Etna” and “Soufrière” projects.

EMSEV will promote and contribute to “Mt Fuji” project by supporting international cooperation.

In year 2021, IAVCEI-GA and IAGA/IASPEI-GA will be organized. Therefore, we propose EMSEV related sessions during IAVCEI 2021, February 15-19, Rotorua, New Zealand and during IAGA/IASPEI 2021, August 22-27, 2021, Hyderabad, India.

6. EMSEV Budget

Incoming : \$3,000.- from IUGG (May 2019)

Outgoing : \$500.- IWEP6 in Chiba (May 31 – July 1, 2019)
: \$300.- for Dr. Y. Sasai for IUGG-GA support.
: \$300.- for Taal operation, September 5-8, 2019
: \$900.- for AGU-GA support, December 2018 (tentative value)
: \$600.- For 4th CSES (tentative value, support two young PhD course students)
: \$400.- For the organization of May 10-12, 2020: Sofia, Bulgaria (S. Pulinets)

Total balance of 2019 budget: \$ 0 remains (tentative)

After different discussions, the €900 2018 remaining budget could be devoted to reinforce cooperation between INGV Catania and EMSEV with the objective to compare EM observations on Etna and other volcanoes (e.g. La Fournaise, basaltic volcanoes).

Remark: EMSEV has a plan to support some field works and further meeting support for young researchers depending on the remaining funds.

7. Business meeting attendees:

T. Nagao (EMSEV Chair, Japan)
J. Y. Liu (EMSEV Secretary, Taiwan)
J. Zlotnicki (EMSEV bureau, IUGG liaison, France)
T. Hashimoto (EMSEV bureau, IAVCEI liaison, Japan)
D. Ouzounov (EMSEV bureau, CSES liaison, USA)
K. Hattori (EMSEV bureau, CSES liaison, Japan)
R. Singh (EMSEV bureau, India/USA)
S. Pulinets (EMSEV bureau, Russia)
M. Kamogawa (EMSEV country liaison, Japan)
J. Blecki (EMSEV country liaison, Poland)
V. Karastahi (EMSEV member, Greece)
X. Zhang (EMSEV member, Greece)
X. Ouyang (EMSEV member, China)
B. K. Bansal (EMSEV member, India)
Y. Sasai (EMSEV member, Japan)
A. DeSantis (EMSEV member, Italy)
A. Sorin (EMSEV member, Russia)