

# Minutes

of the

## Meeting of the IASPEI Commission on Seismic Observation and Interpretation (CoSOI)

**Location:** Cape Town International Convention Center (CTICC), Room 1.61-1.63

**Date:** Wednesday 14 January 2009

**Time:** 18:30 – 20:30 hours

### 1. List of attendants:

No.	Name	Institution	E-mail
1.	Dmitry Storchak (Chairman)	International Seismological Center, UK	<a href="mailto:dmitry@isc.ac.uk">dmitry@isc.ac.uk</a>
2.	Peter Bormann (Secretary)	GFZ German Research Center for Geosciences (GFZ), Germany	<a href="mailto:pb65@gmx.net">pb65@gmx.net</a>
3.	Johannes Schweitzer	NORSAR, Norway	<a href="mailto:johannes@norsar.no">johannes@norsar.no</a>
4.	Bob Engdahl	University of Colorado, USA	<a href="mailto:engdahl@colorado.edu">engdahl@colorado.edu</a>
5.	Ray Buland	USGS/NEIC, USA	<a href="mailto:buland@usgs.gov">buland@usgs.gov</a>
6.	James Dewey	USGS/NEIC, USA	<a href="mailto:dewey@usgs.gov">dewey@usgs.gov</a>
7.	Paul G. Richards	Columbia Univ., Lamont Doherty Earth Observatory, N.Y., USA	<a href="mailto:Richards@LDEO.columbia.edu">Richards@LDEO.columbia.edu</a>
8.	Zhongliang Wu	CEA, ISS, China	<a href="mailto:wuzl@cea-igp.ac.cn">wuzl@cea-igp.ac.cn</a>
9.	Soren Gregersen	GEUS, Denmark	<a href="mailto:sg@geus.dk">sg@geus.dk</a>
10.	Stanislaw Lasocki	AGH University of Science and Technology, Poland	<a href="mailto:lasocki@agh.edu.pl">lasocki@agh.edu.pl</a>
11.	Haruo Sato	Tohoku University, Japan	<a href="mailto:sato@zisin.geophys.tohoku.ac.jp">sato@zisin.geophys.tohoku.ac.jp</a>
12.	Michael Korn	Leipzig University, Germany	<a href="mailto:mikorn@uni-leipzig.de">mikorn@uni-leipzig.de</a>
13.	Remy Bossu	EMSC, France	<a href="mailto:bossu@emsc-csem.org">bossu@emsc-csem.org</a>
14.	Istvan Bondar	ISC, UK	<a href="mailto:istvan@isc.ac.uk">istvan@isc.ac.uk</a>
15.	Paola Albini	INGV, Italy	<a href="mailto:albini@mi.ingv.it">albini@mi.ingv.it</a>
16.	Marcelo Assumpcao	Universidade de Sao Paulo, Brazil	<a href="mailto:marcelo@iag.usp.br">marcelo@iag.usp.br</a>

## 2. Agenda

### 2.1 Working/task groups reports: status, further plans, change of chair (if any)

- WG 1: Scattering and Heterogeneity (Haruo Sato)
- WG2: Magnitudes (James Dewey)
- WG3: Reference Events for Improved Location (Paul Richards and Bob Engdahl)
- WG4: Historical Seismology (Paola Albinì and Katsuhiko Ishibashi)
- WG5: Seismic Networks and Station Codes (Ray Buland)
- WG6: Triggered and Induced Seismicity (Stanislaw Lasocki)
- WG7: Authoritative Locations (Remy Bossu)
- WG8: New Manual of Seismological Observatory Practice (Peter Bormann)
- WG9: Seismological Archives (R.M.W. Musson and J. Schweitzer)

### 2.2 Suggestions for IASPEI Resolutions

### 2.3 Final suggestions/recommendations

## 3. Working groups reports

### **WG 1: Scattering and Heterogeneity**

The Chairman Haruo Sato reviewed past activities of the WG1 since 2005.

- 2007: Publication of the Special Volume 48 of *Advances in Geophysics* (eds. H. Sato and M. Fehler). Topic: *Advances in Wave Propagation in Heterogeneous Earth*;
- 2008 Publication of the special volume 50 of *Advances in Geophysics*, dedicated to K. Aki (eds. H. Sato and M. Fehler). Topic: *Earth Heterogeneity and Scattering Effects on Seismic Waves*. H. Sato presented a detailed list of contents of this volume.

The WG1 met on 14 Jan. 2009 in Cape Town. Haruo Sato announced that he steps down as the chair of the WG1 and recommends Michael Korn as the new chairman. The WG accepted this proposal.

The detailed WG report is available from IASPEI CoSOI web-site.

### **WG2: Magnitudes**

With reference to the new IASPEI standard procedures for magnitude measurements, adopted by CoSOI in 2005, the WG Chairman James Dewey summarized activities, results and encountered problems during the last two years:

- several papers, which advertise and present first results on the application of the new standards, have been published or accepted for publication: Bormann, Liu, Ren, Gutdeutsch, Kaiser in *BSSA* (2007) on related Chinese standards with recommendations for the new IASPEI standards; Bormann and Saul on mB in *SRL* (2008); Bormann, Liu, Xu, Ren, Zhang and Wendt on all teleseismic IASPEI standards, applied to Chinese network data, in *BSSA* (2009, in press), Bormann and Saul on the magnitude problem in general with reference to the need and scope of the new IASPEI standards (2009, *Springer Encyclopedia of Complex Systems Analysis*, in press);

- the ISC has circulated a letter to all its data contributors, requesting a detailed documentation of their current procedures for magnitude determination. Regrettably, this effort has not yet received much response, including also main contributors such as the NEIC and the ISC itself.

Therefore, a need is seen for the following WG activities in **2009/10**:

- Revision and specification of the ISC questionnaire, aimed at avoiding ambiguities and closing gaps in still missing essential pieces of information required for proper assessment and documentation of the specifics and possible inconsistencies in the procedures currently applied at the data contributing institutions (individual stations, regional/national data centres, arrays etc.).
- German members of the WG have volunteered to compile, based on the data they have recently analyzed for their publications, a representative digital broadband test data set for teleseismic events in a wide magnitude and distance range. It would be desirable to provide this test data set to data contributors together with a simple pre-processing software for synthesizing standard WWSSN-SP and –LP records from the BB records as well as guidelines for the interactive analysis of the filtered and unfiltered broadband records for determination of mb, mB(BB), Ms(20) and Ms(BB).
- US members in the WG are requested to compile the same for a representative set of ML and mb(Lg) measurements.
- For 2009 it is further planned to finalize a detailed manuscript about the new IASPEI magnitude measurement standards to be submitted for publication in 2010.
- Further, it is hoped to reach in 2009 agreement with the IDC of the CTBTO on the complementary implementation of the mb(IASPEI) measurement at the IDC. The WG would serve as an advisor to the CTBTO.
- Finally, the WG chairman expects continuous adjustment of the membership of the WG as required for the realization of its work program for the years 2009-2011.

The WG report for the years 2007-2008 with outlook for 2009-11 is available from IASPEI CoSOI web-site.

### **WG3: Reference Events for Improved Location**

Paul Richard reported on behalf of the WG.

- The WG report to CoSOI has been submitted early December 2008 and is attached as Annex 3.
- There is a need for further ground truth at the GT10 and GT5 level.
- The main activity in the last two years has been accomplished at the ISC by Istvan Bondar.
- The ISC now maintains on its website a section on IASPEI GT. Available reference events are listed and specified and new GT data can be contributed. Guidelines are given how to specify and provide the needed evidence for newly contributed GT events.
- In view of this well organized and intensively pursued effort at the ISC no need is seen for continuing the WG. However, former WG members are willing to assist the current activities on GT events at the ISC and to provide advice.
- The co-chairman of the WG, Bob Engdahl, agreed with these statements and recommendations.

The detailed WG report is available from IASPEI CoSOI web-site.

#### **WG4: Historical Seismology**

The WG Co-Chair, Paola Albini, reported about the progress made since Perugia 2007 and further plans of the WG:

- An online website of the WG has been established (<http://emidius.mi.ingv.it/HISEIS/>) and some of its essential contents and features have been demonstrated by P. Albini.
- The current content of the website is still preliminary, a sort of “demo”, inviting people for contributions to the WG plans. The final aim is to provide references to all as of now accessible/identified - relevant publications and data sources, and to enable the downloading of documents as far as copyright regulations permit. The website will offer a submission tool (still under preparation) for new contributions.
- In August 2008 a document has been submitted by Stucchi and Albini to the secretariat for the Global Earthquake Model (GEM) project aimed at propagating a global distribution of information about important historical earthquakes, their features and effects.
- Personal invitations have been extended to a number of experts and activists in the field of historical seismology in conjunction with the GEM meeting in Pavia, Italy, February 2009. Main aim is to increase the number of active collaborators in the IASPEI WG4 on a global scale and thus to achieve a comprehensive survey of world-wide available inventories of earthquake studies and related databases.

The detailed WG report is available from IASPEI CoSOI web-site.

#### **WG5: Seismic Networks and Station Codes**

The WG Chairman Ray Buland summarized and commented on the written WG report, which is attached to these minutes as Annex 5.

- The WG was established in Santiago de Chile, 2005, under the leadership of Avi Shapira, since the existing International Registry of Seismic Stations does no longer meet the needs of the community.
- A model registry has been selected and extended at the Perugia meeting in 2007.
- Ray Buland took over as chairman of the group and a Draft Coding Standard has been worked out by the ISC, NEIC, and the EMSC.
- This draft code assures compatibility for data exchange between seismic parameter and seismic waveform communities, assures a formal attribution mechanism for seismic parameter data as well as greater freedom for network operators to manage station codes.
- The WG recommends adoption of this Coding Standard by CoSOI in Cape Town. If approved, the WG considers its task as completed.
- The main task for the future is the implementation of these new standards. It is recommended that the ISC solicits the upgrading of station information from contributing networks and both the ISC and the NEIC should report on the progress made at the IUGG meeting in Melbourne 2011.
- Further, data and bulletin formats will need to be upgraded to support the new Coding Standard.
- Discussion on the International Registry data services desired by the community is needed. The Registry intends to provide related information in electronic form.
- As a consequence of the above, there is a need to resurrect the WG on Seismic Formats under the chairmanship of Dmitry Storchak.

The WG report is available from IASPEI CoSOI web-site.

### **WG6: Triggered and Induced Seismicity**

The Chairman Stanislaw Lasocki summarized the activities of the WG that had been formed in Santiago de Chile and decided to continue its work in Perugia. The main aim and scope of the WG is the sharing of experience in the monitoring, analysis and interpretation of induced seismic events under different geological and technological conditions. Main products of the WG since 2007 are:

- Publication in 2008 of a special issue of Tectonophysics (eds. S. Lasocki, P. Suhadolc and D. Compté) on “The monitoring of Induced Seismicity: Observations, Models and Interpretation”;
- Realization of a very informative WG website under <http://www.tais.agh.edu.pl>, maintained by Dr. G. Kwiatek at the GFZ Potsdam. The website outlines the tasks of TAIS, provides information about available courses and seminars, forthcoming meetings, latest news, recently uploaded publications, important deadlines etc.
- The WG organized in Cape Town the symposium 4 on Induced Seismicity. 21 orals and 10 posters were presented, some 40-60 people attended S4.

The future plans of the WG are:

- Continuation of its work;
- Further improvement of the WG website, presenting key works on triggered and induced seismicity issues;
- Organize future sessions on induced seismicity, amongst them a joint meeting with AGU in Brazil in 2010 and a IASPEI symposium at the IUGG 2011 in Melbourne.

The detailed WG report is available from IASPEI CoSOI web-site.

### **WG7: Authoritative Locations**

The WG Chairman Remy Bossu reported about the aims, results and problems encountered by the WG:

- A growing number of earthquakes is reported by more than one network. But even in cases where their solutions are within the limits of uncertainties, these differences are often perceived by users/agencies as conflicting. This issue is highly political and not scientifically defined.
- Therefore, for centres which collate parametric data (EMSC, ISC, NEIC) it is essential to define procedures for the definition of preferred solutions;
- Existing schemes based on “Authoritative Regions”, which are usually based on the assumption of constant network performance, showed several drawbacks.

Therefore, the WG proposes alternatives:

- Definition of the best data set to locate the earthquakes using independently determined criteria, e.g. as those for GT5;
- Investigation of primary and secondary network gaps depending on epicentral and angular distances. Two case studies were presented to illustrate the issue;
- Calculation of the best network configuration for the given cases, characterized by the parameter  $\Delta u$ . Diagrams presenting  $\Delta u$  over mislocation were shown and  $\Delta u < 0.35$  was proposed for GT5 events. Stations should be selected accordingly.

The presentation was followed by an extended discussion (J. Schweitzer, R. Engdahl, P. Richards and others), e.g., on the deletion of contributing stations for improved locations,

on the influence of underlying models, on influence of national and institutional politics which might hamper these necessary considerations and developments.

The detailed WG report is available from IASPEI CoSOI web-site.

### **WG8: New Manual of Seismological Observatory Practice**

The WG Chairman P. Bormann reported about the activities since 2007::

- A detailed list of contents for the planned revised and amended NMSOP\_2 has been elaborated. It is based on personal contacts and extensive e-mail exchange with the co-authors of the first edition of the NMSOP and with potential new authors for complementary topics.
- These lists of planned contents for NMSOP\_2 are provided in the WG report attached to these minutes as Annex 8.
- The project has also been outlined in detail in a poster at the Cape Town meeting, inviting also additional complementary contributions.
- NMSOP\_2 is planned as a website edition, posted at the websites of the ISC and the GFZ Potsdam, assuring free access and downloading by all interested users. All contributions to NMSOP\_2 will be peer reviewed and receive doi numbers for easy international search and referencing;
- Essential new contributions to NMSOP\_2 will be Chapter 14 on Strong-Motion Recordings and Data Analysis for Applications in Earthquake Risk Mitigation, Seismology and Engineering (G. Gibson) and Chapter 15 on the Investigation of Site Response in Urban Areas by Using Earthquake Data and Seismic Noise (St. Parolai);
- All other chapters will be updated, some of them with major extensions/revisions, such as Chapter 3 on Seismic Source Parameters (P. Bormann), Chapter 6 on Seismic Recording Systems (G. Asch), Chapter 10 on Seismic Data Formats, Archival and Exchange (B. Dost), Chapter 12 on Intensity and Intensity Scales (R.M.W. Musson) and Chapter 13 on Volcano Seismology (J. Wassermann and J. Neuberg);
- Volume 2 will be complemented especially by web-based interactive tutorials, exercises and demonstration, but also by new data sheets and extended information sheets, e.g., on the New IASPEI magnitude measurement standards (P. Bormann), Seafloor seismic observations using ocean-bottom seismometers (OBS; M. Shinohara); Rotational seismology (W. Lee); Interactive and automatic real-time retrieval of parameter and waveform data via Internet from local to global networks (J. Saul), Automated event and phase identification (L. Kueperkoch), Realtime determination of Es and Me (D. Di Giacomo), detailed user-oriented information sheets by the ISC and other major data centres on their data processing and analysis procedures, data products, complemented by instructions for data contributors on the options and formats for submitting their parameter and waveform data to these centres;
- In total, more than 500 pages of new material have to be elaborated;
- NMSOP\_2 is planned to be ready and tested by the IUGG 2011 meeting in Melbourne. It is planned to demonstrate its essentially new contents and features at a joint workshop session of CoSOI with the IASPEI Commissions on Education and Outreach. Full availability on the ISC and GFZ websites is scheduled for end of 2011, timely contributions and implementations by all authors, the ISC and GFZ provided.

The detailed WG report is available from IASPEI CoSOI web-site.

## **WG9: Seismological Archives**

J. Schweitzer reported, also on behalf of R.M.W. Musson, about the WG on Seismological Archives. It meet last time in Perugia but found it impossible to achieve what it ideally would need to do. Therefore, the group considers itself to be dissolved, yet members intend to continue their informal personal contacts, also with other interested people.

### **2.2 Suggestions for IASPEI Resolutions**

It was recommended that Bob Engdahl drafts a resolution which stresses the need for contributing further reference events.

Ray Buland was requested to draft a resolution related to new convention for seismic network and station codes.

### **2.3 Final suggestions/recommendations**

The Commission approves that the Working Groups 3, 5 and 9 are now officially closed.

It was agreed that CoSOI proposes to the IASPEI to run a Symposium on Seismic Observation and Interpretation during the 2011 Melbourne meeting.

A separate Symposium on Triggered and Induced Seismicity will be convened by WG6 Chair, Stanislaw Lasocki.

Additionally, it was considered meaningful to propose a joint workshop-type session of CoSOI with the IASPEI Commission on Education and Outreach (CoE&O). The main contribution of CoSOI to this meeting would be on the NMSOP\_2 (see above) and on CoSOI supported training activities. Details have to be negotiated with the CoE&O.

Protocol: P. Bormann  
CoSOI secretary

For correctness: D. Storchak  
Chairman of CoSOI