Report of the IAGA Division V Business Meeting

Wednesday 26th August 2009, Hotel Pannonia, Sopron, Hungary, 19:00-20:20

Chair: Monika Korte

Co-Chair (Minutes): Alan Thomson

Agenda

1. Report from Division V Chair: Monika Korte

2. Report from WG V-OBS: Pieter Kotze

3. Report from WG V-DAT: Mita Rajaram

4. Report from WG V-MOD: Stefan Maus

5. IUGG 2011 Session Proposals from Division V

6. Proposal of Resolutions from Division V

7. Any Other Business

Report from Division V Chair

Presented by Monika Korte.

1. Division-related meetings and workshops:

- The **XIIIth IAGA Workshop On Geomagnetic Observatory Instruments, Data Acquisition and Processing** was hosted by USGS and took place in Golden and Boulder, Colorado, USA from June 9 – 18, 2008. The very well organised workshop consisted of measurement sessions at the geomagnetic observatory Boulder and scientific sessions in Golden and was attended by over 100 participants from 36 countries.

- **ESA's second Swarm International Science Meeting** was held from June 24 – 26, 2009 hosted by GFZ Potsdam, Germany. The program consisted of updates concerning the upcoming ESA magnetic satellite mission and scientific talks and was attended by about 100 participants.
- The European magnetic repeat station network **MagNetE** held its 4th workshop in Helsinki, Finland, kindly hosted by the Finnish Meteorological Institute, from June 8 – 10, 2009. The workshop was attended by 21 participants from 12 countries.

2. Division-related publications:

- The **Proceedings of the XIII IAGA Workshop on Geomagnetic Observatory Instruments, Data Acquisition and Processing** are in preparation for publication
- The **IAGA Guide for Calibrating a Magnetic Compass Swing Base** by L. Loubser and L. Newitt has been published in 2009 and is available as pdf at the WG V-OBS website.
- A special issue on "**Seismological, Geological and Tectonic Interpretation of Geomagnetic Anomalies on the Continents and in the Oceans**", resulting from a topical session at the IUGG meeting in Perugia, is in press in Tectonophysics
- A special issue on "**Geomagnetic measurements in remote regions**", resulting from a topical session at the IUGG meeting in Perugia, has been published in Annals of Geophysics, Vol. 52, No. 1 in February 2009
- The **Proceedings of the XII IAGA Workshop on Geomagnetic Observatory Instruments, Data Acquisition and Processing** have been published in Publications of the Institute of Geophyscis, Polisch Academy of Sciences, C-99 (398), in June 2007

3. Report on other topics:

Closure of magnetic observatories

- **Denmark**: The Danish Meteorological Institute (DMI) announced on April 1, 2009 that they plan to terminate all activities in the field of geomagnetism by the end of 2010. Apart from the observatory Brorfelde in Denmark, this

concerns all geomagnetic monitoring of Greenland. DMI announced a termination of measurements of the Greenland magnetometer network during 2009, closure of Godhavn magnetic observatory in 2009 and of Brorfelde observatory by the end of 2010. Only a “continuation at a technical level” of the observatories Qaarnaaq and Narsarsuaq was considered.

Internationally this raised a large amount of letters of concern being written to DMI and the relevant ministries, among them one by the IAGA Div. V chairs. To our knowledge, Danish institutes and funding agencies are negotiating possible continuations of the ground observations in Denmark and Greenland, but the situation is unresolved yet.

- **USA**: The USGS terminated magnetic observations at Del Rio magnetic observatory, Texas, on June 30, 2009, in order to re-direct the funding to improve their remaining 13 observatories.

Comments in open discussion: None

Report from Working Group V-OBS

Presented by Pieter Kotze.

V-OBS Business Meeting: Tuesday 25 August 2009 12:00

Agenda

Welcome and remarks from chair

Report on Golden/ Boulder Workshop: J Love

INTERMAGNET: J Love

Report on Task Team: Mean Hourly Values: P Hejda

New gyromagnetic constant γp: Po Gyo Park

Next workshop in China 2010: Dongmei Yang

Proposal for the 2012 workshop: M Catalan

Proposals for sessions and conveners – Melbourne (Australia) 2011 IUGG Meeting

Proposal for IAGA resolution

General

Remarks from the WG Chair

- IAGA Guide for compass calibrations and compass swing bases, authored by Louis Loubser (HMO) and Larry Newitt (Canada) has been placed on WG website: http://www.meteo.be/IAGA_WG_V.1/
- IAGA Codes for magnetic observatories:
  - Guidelines available on WG website
  - 3 new observatories:
  - Gingin (GNG) - Australia
  - Kupang (KPG, Pelabuhan (PLR) – Indonesia
- Health status:
  - Constant threat of downsizing and closure
  - Denmark / Greenland
  - Proposed IAGA resolution

New Gyromagnetic Constant γ_p'

- IUGG Vienna 1991:

  $\gamma_p 10^8$ 2.67515255 = ′ $T^{-1}s^{-1}$

  CODATA 1986

- New $\gamma_p 10^8$ 2.675153362 = ′ $T^{-1}s^{-1}$

  CODATA 2006

  (Rev. Mod. Phys. Vol 80, 2008)

- Recommend

  2010 for implementation

  IAGA resolution proposed

Comments:

F.Lowes: What difference in nT does the change in gyro constant make?

P.Kotze: 15pT in 50,000nT

Comments on observatory resolution (see below):

P.Taylor: How long has Denmark been operating observatories?

N.Olsen: since around 1926

P.Taylor: How does this impact IGRF?

M.Korte: Difficult to quantify impact on IGRF. Closure of the high latitude observatories will severely affect external magnetic field research.

Report from Working Group V-DAT

Presented by Mita Rajaram.

Agenda

1. Introduction / Update from 2007 Meeting (Dr. Mita Rajaram)

2. Discussion items related to IAGA index :
   a. Criteria for index endorsement (Dr. Menvielle) – voting
   b. Endorsement of PC (Dr. McCreadie)

   c. Endorsement of SC (Dr. Curto and Dr. Thomson) – voting

   d. Overview on New indices suggested during the last 2-4 yr. (Dr. Lukianova)

3. Status of IAGA indices and other reports

   a. Brief reports on IAGA indices (Drs. Nose, Matzka, Linthe, Menvielle)

b. Current work on Data rescue (Dr. Nandini Nagarajan)

4. IAGA Resolutions

5. Sessions for IUGG2011

1. Update since last Meeting in Perugia, 2007

WGV.DAT website has been updated.

Three Task Forces formed and their reports were ready for presentation:

a. Task Force for Criteria of Index endorsement of an index by IAGA (Drs. Menvielle, Thomson, McCreadie, Lukianova, Stauning, Rajaram)

b. Task Force for the Endorsement of PC as an IAGA index ((Drs. Menvielle, McCreadie, Lukianova, Stauning - proposer)

c. Task Force for IAGA Endorsement of the classification of rapid variations as SC (Drs. Menvielle, Thomson, Nose, Curto - proposer)

2. Discussion Items related to IAGA indices

a. Criteria for index endorsement by IAGA (Dr. M. Menvielle)

After intense discussion and through email exchange a report was made and circulated. Drs. Iyemori, Korte and Kharin made their valuable comments that have been incorporated in the report. The report was presented by Dr. Menvielle, put to vote and finally adopted by a great majority.

The document includes: Properties that a geomagnetic activity index proposed for endorsement by IAGA should possess and Process according to which IAGA will consider endorsing the index

The document will be published in IAGA News and posted at the WG web

b. Status of PC as an IAGA index (Dr. McCreadie)

Dr. McCreadie prepared a comprehensive report after going through several related documents and with contributions from Drs. Stauning and Troshichev.

The report included a brief history of IAGA's involvement with PC. The index is definitely useful. The definition of the Stauning's PCN index and AARI PCS index is unified and it definitely has an affinity with the PC merging electric field.

It was noted that the way the indices are computed is different. The current index is not yet at its final stage of development. The official PCN index is no longer compatible with the PCS index.

The WG recommends that a comprehensive report with details of all issues regarding the derivation of the coefficients and calculation of actual PC index values be written within one year. The report should be reviewed by the Task Force and be published e.g. at ISGI website in order to provide a basis for a final decision on endorsement by IAGA at the 2011 meeting.

c. Endorsement of the classification of rapid variations as SC.

Report was presented by Dr. Curto. Dr. Thomson then presented the views of the Task Force – ready to endorse it. Put to vote and finally adopted by a majority.

New criteria:

Specific parameters were introduced to make the process more objective :

- Suddeness -> Rate of Change (dBx/dt) : dBx/dt > 3nT/min
- Change of rhythm -> Dst and Kp indices: Dst<-50 v Kp>5

Conclusion

The result of the automated detection process with the new criteria is equivalent to the old (manual) one.

- New criteria will allow Ebro to automate the process by introducing quantitative evaluations.
- The classification process with the new criteria improves class separation (SI and SSC).
- SSC lists do not mislead users any more because they are followed by real magnetic storms.
- Documents will be placed on V-DAT website

d. Overview on New indices suggested during the last 4 yr (Dr. Lukianova)

Statistics of publications *(2003-2008)* in the main scientific journals shows the increasing number of papers essentially making use of geomagnetic indices in their investigations.

Watch of the newly proposed indices:

- Interhourly variability index, IHV (Interdiurnal variability index, IDV) characterizes the variability of the geomagnetic components;
- *ULF wave index* characterizes the turbulent level of the geomagnetic field;
- Polar magnetic (PM) index describes the polar caps geomagnetic activity.

Status of IAGA indices

- Dst/AE/SYM Indices and WDC Kyoto (Dr. Nose)
- K-index for BFE(Dr. Matzka, DMI)
- Report on Bartels' Planetary Indices Kp, ap, Ap, Cp, C9 (Dr. Linthe, GFZ, Potsdam)
- Report on aa, am indices (Dr. Menvielle, ISGI)

Although there are some problems with the K index at BFE, in general, all IAGA indices are in good health

Current work on Data rescue (Dr. Nandini Nagarajan)

Efforts on Preserving Metadata

ICSU-funded project 'Archiving of old analogue magnetograms' by IAGA Task force was carried out 2003-2004. High-resolution digital Images of magneto-grams of Colaba-Alibag, IIG for 1901-1920 executed. The project has been successfully accomplished. Institutes like IIG and NGRI have continued to fund additional metadata preservation and dissemination work. Four WDC's (Kyoto, Russia, Mumbai and Edinburgh) have been involved in preserving and disseminating Metadata.

Suggestions, what should be done?

- Several Observatories with long series of geomagnetic magnetograms have expressed interest in preserving valuable and irreplaceable metadata. Mexico, China, South Africa have expressed such a need. This helps in extending the

data-line backward, and electronically, so that it is accessible for interdisciplinary studies of the planet and its environment.

- IAGA can seek funding for WDC-s to assist worldwide Observatories in preserving and disseminating metadata - yearbooks, as well as images.

IUGG2011 Session Proposals

1. Geomagnetic products for space weather and space climate (IAGA Div. V and IV)

   Convenor: Kalevi Mursula

   Co-convenor: Toshiko Iyemori

2. Seismological and Tectonic interpretation of geomagnetic data and earthquakes (IA)

Convenor: Dr. ME Purucker (IAGA)

Co-convenor: Dr. J. Kayal (IASPEI), Walter Mooney

3. Geophysical data rescue and application of historical time series for earth science (IA)

4. Networks, computation and definition of geomagnetic indices

Convenors: Heather McCreadie, Renata Lukianova, JJ Curto

Comments:

H.McCreadie: The PC index review document will be published in due course.

F.Lowes: Will the IAGA resolution on index criteria (for adoption by IAGA) be acceptable as aren't there other indices are produced outside division 5?

M.Korte: It is not clear that anyone else is affected by this. (Generally agreed.)

M.Menvielle: The IAGA executive will have a view on the resolution detailing acceptability of indices for adoption by IAGA.

M.Korte: In the resolutions committee if they are not happy with the wording or sentiment they will throw it out.

D.Kerridge: The executive will indeed look at this as they have the authority to do so. Suggestion made (unknown speaker) to make the resolution as general and comprehensive as to be acceptable to other divisions.

M.Korte: We will come back to this during discussion on resolutions.

General agreement to do so, without dissent.

Report from Working Group V-MOD

Presented by Stefan Maus.

- International Geomagnetic Reference Field
  - Analysis of previous IGRF-10 shows that prediction of SV remains biggest challenge in producing IGRF
  - Best SV candidate model for SV-2005-2010 was submitted by IZMIRAN
  - IGRF-11 call has been issued (Main field to deg 13, SV to deg 8, unchanged)
  - Available data: ~180 Observatories, CHAMP and Ørsted satellite data
  - 8 Teams will contribute candidate models
  - On track to release IGRF-11 at the end of 2009
- Proposed ISO standard for the main field
  - Title: "ISO standard for internal geomagnetic reference field models"
  - We have agreed on a standard file format
  - Draft document will be written up and circulated for comment

- 2nd Ed. World Digital Magnetic Anomaly Map to be released at IUGG-2011
  - Call for data and team registrations by April 2010
  - Candidate submission deadline: October 2010
  - Evaluation: ready at Fall AGU 2010
  - Map submission to CGMW for printing: EGU 2011
- Proposed sessions for IUGG 2011

Comments:

MMenvielle: Are there any ISO issues on copyright.

HMcCreadie: ISO can take copyright of any product.

SMaus: The method, not any individual model, is the item being standardised.

M.Menvielle: ISO are industrial products therefore they often use patents. So be very careful.

AThomson: Suggested to contact other people in the ISO WG in the space sector to seek their opinion, e.g. experience on the proposed magnetospheric standard.

SMaus: Agreed to follow up on any copyright issues.

THurst: On the call for data for WDMAM, what do you mean? When are you going to call? How will we hear?

SMaus: via mailing lists and IAGA, plus personal contact via letter.

IUGG2011 Session Proposals from Division V

Proposals from WG V-OBS

- Metadata requirements for data stewardship in geophysical research and operations: Don Herzog, Tony Hurst (1/2 day)
- Geomagnetic field secular variation as derived from observatory and satellite measurements: Aude Chambodut & ? (1 day)

- Geomagnetic observatories, their instrumentation and management: Hans-Joachim Linthe, Manuel Catalan (1/2 day)

Proposals from WG V-DAT

- 1. Geomagnetic products for space weather and space climate (Div. V and IV) Convenor: Kalevi Mursula, Toshiko Iyemori
    - 2. Seismological and Tectonic interpretation of geomagnetic data and earthquakes (IA)Convenor: Dr. ME Purucker (IAGA), Dr. J. Kayal (IASPEI)
    - 3. Geophysical data rescue and application of historical time series for Earth science (IA)Convenors: TBD
    - 4. Networks, computation and definition of geomagnetic indicesConvenors: Heather McCreadie, Renata Lukianova, JJ Curto

Proposals from WG V-MOD

- 1. Geomagnetic secular variation on annual to centennial scales Conveners: C. Finlay,
    - 2. Modeling of lithospheric, external and induced magnetic fields Conveners: M. Hamoudi,
    - 3. Tectonic interpretation of magnetic data combined with other geophysical results Conveners: D. Ravat,
    - 4. Results from the decade of geopotential research and beyond Conveners: C. Beggan,
    - 5. WDMAM-2011Conveners: E. Thebault,

As amended from the working group original suggestions through subsequent discussions prior to the Division V business meeting:

- **Geomagnetic observatories, their Instrumentation and Management – Basement for Geomagnetic Research (V-OBS)**
  Conveners: Hans-Joachim Linthe, Manuel Catalan 1 day
- **Present and historical geophysical data rescue and metadata requirements for the Earth sciences (V-DAT, V-OBS, Div. IA, IASPEI)**
  1 day
  Conveners Don Herzog, Tony Hurst, Ellen Clarke
- **Geomagnetic field secular variation an annual to centennial scale as derived from observatory and satellite measurements (V-OBS & V-MOD**

& Div. I)
Conveners: Arnault Chulliat, Chris Finlay 1 day

- **Geomagnetic networks, computation and definition of products for space weather and space climate (V-DAT and Div. IV)** 1 day
  Convenor: Kalevi Mursula, Toshiko Iyemori, Heather McCreadie, Renata Lukianova, JJ Curto
- **Modeling of lithospheric, external and induced magnetic fields (V-MOD)**
  Conveners: M. Hamoudi, M. Rajaram 1 day
- **Results from the decade of geopotential research and beyond (V-MOD)**
  Conveners: C. Beggan, 1day
- **Seismological and Tectonic interpretation of geomagnetic data combined with other geophysical results (IA) (V-DAT, V-MOD, IASPEI, Div. I-2?)**
  Convenors: Michael Purucker (IAGA), J. Kayal (IASPEI), D. Ravat, Walter Mooney? 1 day
- **WDMAM-2011 (V-MOD)**
  Conveners: E. Thebault, J. Korhonen 0.5 day
- **Reporter Reviews**
  Conveners: M. Korte and A. Thomson 0.5 day
- **Open poster session with Div. I**
- **ION Proposal for a Union Session (joint with IASPEI, IAPSO amd IAGA) at the IUGG Melbourne 2011 General Assembly:**

  Scientific Results from Seafloor Networks
  Conveners: M. Best, P. Favali, Y. Kaneda and R. Stephen

MKorte: All proposals have been streamlined through face-to-face contacts today, due to a degree of overlap in content and intention.

EClarke: The session on data rescue was meant to be on technical issues and the proposed joint session seems too much to fit in on one day.

MKorte: can you therefore discuss with DHerzog on a formulation that works?

EClarke: yes.

RLukianova: What about a joint session with division 4 on space weather products? Agreed.

MKorte: (comment) these sessions titles will go to IAGA committee to finally decide sessions.

MKorte: A final proposed joint session on seafloor networks was proposed to us by ION proposal. Agreed by those present.

Proposal of Resolutions from Division V

1. V-OBS resolution on observatories.

IAGA,

recognising the importance of the combination of a global geomagnetic observatory network and modern satellite missions in optimizing progress in geomagnetism science, including greater understanding of the 'Earth system' and more accurate mapping and prediction of Geomagnetic field changes and space weather conditions,

notes that many geomagnetic observatories continue to have uncertain futures, and therefore

appreciates the support of national science agencies in ensuring the continued operation of magnetic observatories during the lifetime of the ESA Swarm satellite mission and beyond.

NOlsen: why ‘national science agencies’? why not ‘funding agencies’?

HMcCreadie: Also, drop word ‘science’.

Agreed.

2. V-OBS resolution on quasi-definitive data.

IAGA,
recognising the importance of fast baseline-corrected observatory data for the

production of geomagnetic models such as the IGRF and geomagnetic indices,
noting that several individual users and groups of users, such as the Mission Advisory Group of the upcoming ESA Swarm satellite mission, have expressed their interest and need for such data,
encourages magnetic observatories to produce baseline-corrected quasi-definitive data shortly after their acquisition.

FLowes: Say ‘prompt’ rather than ‘fast’.

Agreed

3. V-OBS resolution on CODATA gyromagnetic constant.

Resolution text obtained from WG V-OBS Chair P. Kotzé:

3. Division V, and particularly Working Group V OBS advises IAGA to adopt the recently CODATA 2006 published value of the proton geomagnetic constant γ_p**=** ´ **10^8 2.675153362 $T^{-1}s^{-1}$** as the official value and to replace the 1991 accepted value,

recommending that this change be implemented as of 1 January 2010

Attempt from Div. V Chairs to turn it into IAGA resolution style:

IAGA,
noting a recent change of the gyromagnetic constant published by CODATA 2006
adopts the new value g **= 2.675153362 108 $T^{-1}s^{-1}$** to replace the value accepted in 1991 to be used for data from 01.01.2010 onward, and
urges instrument manufacturers and geomagnetic observatories to implement this new value in data processing.

MKorte: Postpone until a Task Group from WG V-OBS has presented a report what is required from observatories and instrument manufacturers in order to implement this change at a defined date so that all data that are influenced by the small change are obtained with the same value again?

Agreed.

4. V-DAT resolution on index endorsement.

IAGA,

recognising the importance of endorsement of geomagnetic indices by IAGA as a guarantee of the quality of index data provided to the worldwide scientific community, and

noting that there is no published definition of the properties of geomagnetic indices required for, and of the process of, endorsement of geomagnetic indices by IAGA; therefore

adopts the Index criteria document, to be published in IAGA news; as the criteria for endorsement of proposed geomagnetic indices.

FLowes: IAGA resolutions are meant for community outside IAGA, not for ourselves.

MMenvielle: explains why it was proposed. Therefore asks for some official statement by IAGA of support for this proposal, even if not in the form of a resolution.

DKerridge: We invented an IAGA guide for officers, so this could be done this way, i.e. request IAGA to insert this index proposal document into the existing guide as a future reference. So we should approach IAGA executive with this request.

Agreed.

5. V-DAT resolution on SC index.

IAGA,

recognising

the importance of the list of storm sudden commencements (ssc), continuous since 1868, to the worldwide scientific community, and

appreciating

the efforts of Ebro magnetic observatory in regularly maintaining and circulating the up-to-date list of events, and

noting

that the definitions of storm commencements (sc), sudden impulses (si), and storm sudden commencements (ssc) have changed over time, reflecting better

understanding of physical processes and changes in instruments and working practises, and

that a new method, relying on quantitative criteria for sc/ssc/si determination, has been proposed by the Ebro team, published in "*Evolution of the concept of Sudden Storm Commencements and their operative identification"* by J. J. Curto, T. Araki, and L. F. Alberca (*Earth Planets Space,* **59**, 2007), and to be described in a revised IAGA Guide for Geomagnetic Indices, and

that this method is well defined and reproducible and that it produces data that are homogeneous with data produced using the existing method developed by P.N. Mayaud,

endorses

this new method as the basis for the future determination of sc/ssc/si, as contained in the list of events published by Ebro observatory .

FLowes: Is this not the same as the previous, i.e. an instruction to ourselves.

MMenvielle: SC method is documented in IAGA bulletin from 1960s (from Mayaud).

HMcCreadie: Don't all IAGA indices have a resolution somewhere?

MKorte: So what is appropriate here?

General agreement to put this forward as a resolution as it *does* affect the outside world, following additional comments to this affect by PHejda.

Agreed.

6. V-DAT resolution on metadata.

IAGA,

recognising

the importance of long time series of data supporting global change studies and the objective of the International Years

appreciates

the support given by ICSU to recent efforts for preservation and dissemination of valuable historical metadata, that extend the data-line backwards and electronically,

so that it is accessible for interdisciplinary studies of the planet and its environment, and,

urges

that similar preservation and dissemination of metadata worldwide be supported by relevant agencies.

Open discussion on whether the word metadata is appropriate here?

RHolme: we have had resolutions on data saving before so it is appropriate.

AChulliat: proposes a suggestion on re-wording, generally agreed: Drop ‘historical’ and ‘extends data line backward and forwards’. Also suggests ‘Recognising the importance of metadata for ...’ and suggest forget ‘long-time series’ part. Will work on the detailed wording tomorrow and put forward to resolution committee.

Agreed.

Any Other Business

None

The chair thanked those present for their attendance and contributions and closed the meeting at 20:20.

Appendix: Contact Details

Division V

Chair:

Dr. Monika Korte

GeoForschungsZentrum Potsdam

Telegrafenberg

14473 Potsdam

Germany

Co-Chair:

Dr. Alan W P Thomson

Geomagnetism,

British Geological Survey,

West Mains Road,

Edinburgh EH9 3LA,

UK

Working Group V-OBS

Chair:

Dr. Pieter Kotzé

Hermanus Magnetic Observatory

P O Box 32, Hermanus 7200

South Africa

Co-Chair

Dr. Pavel Hejda

Institute of Geophysics AS CR

Bocni II/1401

141 31 Prague

Czech Republic

Working Group V-MOD

Chair

Dr. Stefan Maus

CIRES, University of Colorado,

David Skaggs Research Center

NOAA/NGDC E/GC1

325 Broadway

Boulder, CO 80305-3328

USA

Co-Chair

Dr. Christopher Finlay

Earth and Planetary Magnetism Group

Institute of Geophysics,

ETH Zurich

HPP L2.2, Hoenggerberg

Zurich

CH-8093

Switzerland

Working Group V-DAT

Chair:

Dr. Mita Rajaram
Indian Institute of Geomagnetism
Kalamboli Highway, New Panvel (W),
Navi Mumbai 410218.

INDIA.

Co-Chair:

Dr. Renata Lukianova

Department of Ocean-Atmosphere Interaction,

Arctic and Antarctic Research Institute,

Russian Federal Survey for Hydrometeorology and Environmental Monitoring

38 Bering Street,

199397 St.Petersburg,

Russia