INTERMAGNET EXCON/OPSCOM Meeting

Venue: National Geophysical Research Institute (NGRI)
Habsiguda, Uppal Road, Hyderabad,
Andhra Pradesh 500007, India

October 18 - 20, 2014

Report to INTERMAGNET Observatories

The meeting was held at the offices of the National Geophysical Research Institute (NGRI) in Hyderabad, Andhra Pradesh, India.

We were welcomed at the beginning of the meeting by Dr Kusumita Arora, Principal Scientist at the Magnetic Observatory of the NGRI. Jeff Love, Chair of EXCON, launched the meeting by a few words.

The Staff of the Magnetic Observatory, organizers of the meeting, provided valuable support: airport pick-ups and drop-offs, transport, meals, conference rooms and equipment as well as much needed facilities and help for the participants in the preparation and execution of their tasks. Wonderful dinners at the Minerva Grand and at the picturesque restaurant "Gulrose" in the Chiraan Fort Club were highlights of the meeting.

A visit to the Hyderabad geomagnetic observatory was organized for the INTERMAGNET officers and meeting guests. Many thanks to Kusumita and the staff of the Magnetic Observatory for the great hospitality and support!

Participants (Figure 1)

EXCON
Kerridge, David
Love, Jeff
Finn Carol
Hulot Gauthier
Thomson Alan
Excused : Boteler D. and Chulliat A.

OPSCOM
Blais,Charles
Crosthwaite,Peter
Flower,Simon
Linthe,Hans-Joachim
Matzka,Jürgen
Nose,Masahito
Rasson,Jean
Reda,Jan
Stewart,Duff
St-Louis,Benoit
Turbitt,Chris
Excused: Maury,Virginie

Observers
Minamoto Yasuhiro
Arora Kusumita
Korte Monica
Veenadhari B.
Anca Isac
Royal Guy
Miklavec Mojca

EXCON membership

The following officers announced their retirement from EXCON to take place after this Hyderabad meeting: Chulliat Arnaud, Kerridge David and Love Jeff. Three new members were proposed by EXCON: Finn Carol (USA), Hulot Gauthier (France) and Thomson Alan (UK). Alan will become the new EXCON chairman.

OPSCOM membership and Subcommittees

The OPSCOM Officers were unchanged since the previous Copenhagen 2013 meeting and there was no modification in the Subcommittee membership. Joachim Linthe

announced his retirement from OPSCOM after this Hyderabad meeting given he will become a pensioner at the end of 2014.

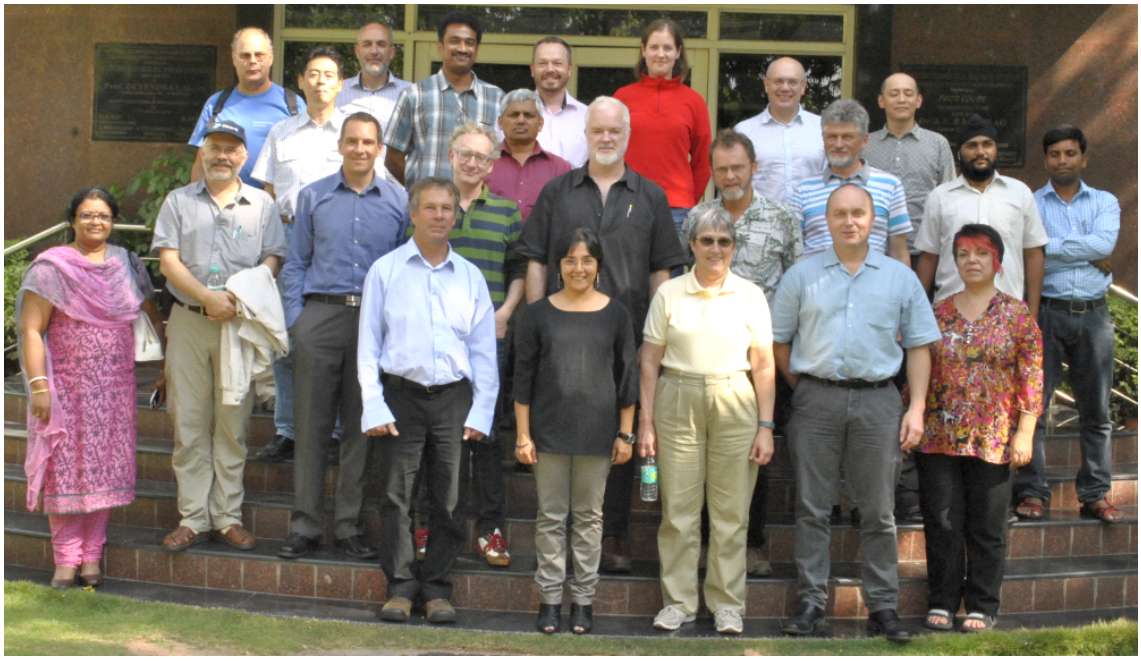

Figure 1. Meeting participants posing outside the NGRI in Hyderabad

Subcommittees

Subcommittee: / # members:	Definitive Data	WWW/GINS & Data Formats	Technical Manual	IMO Applications	Instrumentation & Data Acq.
	7	8	7	6	6
B. St-Louis			**Benoît**	Benoît	Benoît
C. Blais	Charles	Charles			
C. Turbitt			Chris	**Chris**	Chris
D. Stewart		Duff		Duff	Duff
J. Linthe	Joachim	Joachim	Joachim		
J. Matzka	Jürgen		Jürgen	Jürgen	Jürgen
J. Rasson			Jean	Jean	Jean
J. Reda	**Jan**	Jan			
M. Nose	Masahito	Masahito	Masahito		
P. Crosthwaite		Peter	Peter		**Peter**
S. Flower	Simon	**Simon**			
V. Maury	Virginie	Virginie		Virginie	

Presentations at the meeting

Simon Flower: INTERMAGNET's membership of the World Data System
Simon Flower: the new (1-second) data format

Subcommittee on IMO applications and standards

IMO applications

The following Observatories, conditionally accepted at the Copenhagen 2013 meeting have been fully accepted since the start of their data transmission to a GIN:

- Jaipur (JAI), India
- Cheongyang (CYG), South Korea
- Khabarovsk (KBH), Russia.

The Subcommittee on IMO applications and standards received and reviewed the applications from the following Observatories wishing to join INTERMAGNET:

- Sonmiani (SON), Pakistan - Accepted.

- Sable Island (SBL), Canada - Accepted.
- King Edward Point (KEP), South Georgia - Accepted.

There is now a total of 128 IMO's.

GIN/WWW/Data Format Subcommittee

1-second data, quasi-definitive data and real-time data delivery

Scientific research into space weather and the development of monitoring tools will benefit from the availability of quasi-definitive, 1-second and real time data delivery from INTERMAGNET observatories. Observatory data are particularly relevant in modelling, monitoring and predicting the impact of space weather on electrical power grids and other ground based technologies. The new observatory data products will also be used in conjunction with satellite surveys, for example by scientists on the ESA Swarm mission, to understand geomagnetic processes seen at both satellite and ground level, for example dynamic ionospheric currents that flow between the two.

INTERMAGNET has a standard for 1-second data. The standard is designed to encourage production of high quality data and may take some time to implement in the community. However we know that a number of observatories are already producing 1-second data. We encourage observatories who are able to do so to send us their 1-second data values in IAGA-2002 format. Preliminary data can be sent to GINs using the same mechanisms that are currently used to send 1-minute data. There will be a call for 2014 definitive data some time in 2015.

INTERMAGNET has defined a standard for a type of data called quasi-definitive. As the name implies the data should be close to the expected definitive value, but is to be delivered more rapidly than an observatory's annual definitive data. Experience has shown that it is possible to deliver quasi-definitive data in a timely manner that is often in agreement with definitive data to within 1nT, and almost always within 5nT, under normal operating conditions (see the accompanying PowerPoint presentation QDpresentation.pdf for an analysis of quasi-definitive data delivered in 2012). More details are available in the FAQ section of the INTERMAGNET web site: http://www.intermagnet.org/faqs-eng.php#quasi-definitive

The INTERMAGNET communications infrastructure is able to support transport of data from observatories to the INTERMAGNET web site within minutes of its being recorded. The easiest way to do this is to use the new web-based delivery mechanism and to send data in the IAGA-2002 format. If you need more details of this, contact Simon Flower (the Edinburgh GIN manager): smf@bgs.ac.uk.

We have described these services before and a number of observatories are already contributing to them. We strongly encourage those of you who have not yet done so to start contributing these new data products, which are designed to support a range of scientific activity, from modelling of the core field to monitoring and investigation of space weather. If you have questions or problems with the production of any of these data products please speak to an INTERMAGNET committee member – their contact details are here: www.intermagnet.org/Structops_e.php. The full value of these data products will not be realised until there is a truly global contribution of data.

Availability of new data products at the INTERMAGNET web site

Thank you to all observatories that are now sending quasi-definitive and 1-second data to INTERMAGNET. The table below lists the number of days of quasi-definitive data received from each observatory since the start of 2013 (this information was gathered on 16th October 2014):

aaa	0	hrb	0	tsu	0	czt	424	brw	577	maw	630
abg	0	iqa	0	tuc	0	lzh	424	cmo	577	asc	631
aia	0	irt	0	val	0	hrn	448	frd	577	ler	637
arms	0	izn	0	vic	0	ipm	455	gua	577	spt	637
ars	0	kiv	0	vos	0	kou	455	hon	577	abk	638
bfo	0	kmh	0	vss	0	mbo	455	new	577	asp	638
blc	0	lvv	0	wmq	0	phu	455	sjg	577	dki	638
bmt	0	mea	0	yak	0	eyr	486	gng	604	esk	638
bsl	0	ncq	0	ykc	0	bel	487	mcq	607	gdh	638
cbb	0	nur	0	fur	91	kny	488	box	608	had	638
cnh	0	ott	0	orc	123	mmb	497	clf	608	her	638
cyg	0	peg	0	mgd	168	pet	497	csy	608	lyc	638
ded	0	pil	0	hyb	182	dou	515	cta	608	naq	638
dmc	0	res	0	khb	219	tam	515	kak	608	pst	638
dur	0	sfs	0	hua	246	mab	516	ngk	608	thl	638
fcc	0	shu	0	aae	304	sua	517	tdc	608	ups	638
frn	0	sit	0	nvs	334	dlt	546	wng	608		
gdk	0	sod	0	api	341	drv	546	gan	616		
gzh	0	stj	0	ppt	365	paf	546	kdu	621		
hbk	0	thy	0	pag	391	sba	564	lrm	622		
hlp	0	trw	0	ebr	396	bou	577	cnb	630		

The following table lists the observatories which provided some 1-second data to the INTERMAGNET web site in September 2014:

aae	cmo	frd	lrm	phu
abk	cnb	frn	lyc	ppt
arms	csy	gng	lzh	res
api	cta	gua	maw	sba
asp	cyg	hlp	mbo	shu
bdv	czt	hon	mcq	sit
bel	ded	hrn	mea	sjg
blc	dlt	ipm	mmb	stj
bou	dmc	iqa	new	tam
brw	drv	kak	nur	tuc
bsl	ebr	kdu	ott	ups
cbb	eyr	kny	paf	vic
clf	fcc	kou	peg	

Digital Object Identifiers

Digital Object Identifiers (DOIs) are a means by which institutes can be given credit for the work they do to produce geomagnetic data. They are also useful in guaranteeing exact reproducibility of a particular data set. Deciding when and where to use DOIs with data that INTERMAGNET holds is complex. If we try to resolve all the issues, we are unlikely to ever get started. In order to gain some experience with DOIs, we will be doing the following:

1. Creating a single DOI for the entire INERMAGNET CD/DVD archive of definitive minute data. This DOI will reference the DOIs in item 2
2. Creating individual DOIs for each year of CD/DVD minute definitive data. These DOIs will reference any DOIs created by institutes for the data

3. Looking into whether INTERMAGNET can create DOIs on behalf of Institutes. We will encourage and support institutes in creating DOIs for their own data

One of the goals of this approach is to ensure that institutes can receive credit for the work they do to create high quality geomagnetic data. If you have any comments or suggestions on this, please contact Simon Flower: smf@bgs.ac.uk.

New data format

INTERMAGNET is close to completing work on a new data format – there have been delays to this work in order to include a new requirement for a precise description of the standards that a piece of data conforms to. This work is now close to completion and the new data format will be communicated to institutes and users in the next few months. The original motivation for creating the new format, which is based on NASA's Common Data Format (CDF) software, was to allow for higher precision data that the current IAGA-2002 format allows. However it is hoped that the new format will take over many of the existing INTERMAGNET data formats in the future. More details to follow.

World Data System

INTERMAGNET has been accepted as a member of the World Data System, subject to completion of a memorandum of understanding between the World Data System and INTERMAGNET. The memorandum of understanding has been agreed in draft and waits signing. You can find out more about the World Data System here: https://www.icsu-wds.org/.

Technical Manual Subcommittee

It was proposed and agreed to publish the Technical Manual on the INTERMAGNET website as active web pages and dynamically generated PDF documents. A version level will be added for the automatic updates from the metadata. It will be possible to recover any prior version of the manual and active links will be available in both the web pages and the PDF version.

Definitive Data subcommittee

Call for 2014 definitive data

It has been decided that the requests named "call for 1min definitive data" and "call for 1-sec definitive data" will be sent to the IMOs separately. 1-sec definitive data will be provided to INTERMAGNET using an ftp protocol.

New country maps on the DVD

Concerning the geographical information included for each IMO location, it was decided to provide a small KML file for each observatory's Institute, including observatory coordinates, center of the map and default magnification, to be opened in Google Earth, as well as the screenshot of the map for those users not having Google Earth installed or easy access to the internet. The user can then add country borders to the map by ticking the box on the left panel in Google Earth".

Instrumentation and data acquisition subcommittee

The IAGA workshop immediately preceding this meeting emphasised the importance of a knowledge data base to assist observatories starting up and improving operations. A "List of Instruments and Resources" has been created. Once the list will be ready it will be posted to the INTERMAGNET web site for public access.

The next EXCON/OPSCOM meeting

The next INTERMAGNET meeting will be held in Niemegk, Germany just before the IUGG Assembly. The preliminary dates for this meeting are set as June 18 – 20, 2015.

Please note that IMO's may send observers to this meeting (inform OPSCOM of your plans). IMO's are welcome to submit topics for discussion at this upcoming Niemegk 2015 meeting.