

## **URSI/IAGA Joint Working Group on VERSIM (VLF/ELF Remote Sensing of the Ionosphere and Magnetosphere)**

Business meeting - Monday 7 July 2003

There was a meeting of the VERSIM working group during the 23rd General Assembly of the International Union of Geodesy and Geophysics, held in Sapporo (Japan), at 1900 on Monday 7 July 2003.

Present: AJ Smith (United Kingdom) in the chair, M Parrot (France), M Clilverd (United Kingdom), C Haldoupis (Greece), CJ Rodger (New Zealand), R McCormick (New Zealand), J Lastovika (Czech Republic).

### Chairman's Report:

Andy Smith (the IAGA co-chairman), described the purpose of the working group, and outlined activities of the working group since the previous IAGA meeting, held in Hanoi (Vietnam) in 2001, and the last URSI meeting, held in Maastricht (Netherlands) in 2003. This included a summary of those meetings plus the sessions supported by VERSIM during both the IAGA and URSI conferences.

### Future of the working group:

It was unanimously agreed to recommend that the working group continue in existence for the period up to the next IAGA meeting (2003-2005). At this time the issue will be put to the VERSIM community again. This does not reflect a feeling that the working group should necessarily be wound up, it simply reflects the normal process for reporting to our parent bodies (IAGA and URSI). Currently the working group has a membership, which is measured by the number of people on our mailing list, of 96 scientists in 23 countries.

### Reports from VERSIM research groups:

**UK** Andy Smith summarised the current VLF/ELF observations being made by British Antarctic Survey. They are continuing with synoptic broadband recordings at Halley Station and in addition are continuing with the VELOX multi-band receiver system which has been running since 1992. They have a whole solar cycle of data from this experiment in 10 bands at 1 s resolution. They also have a narrow band tunable receiver which was switched to 19.3 kHz in January for the South Pole Beacon experiment. The signal from the Beacon was observed at Halley during that time, although quite weakly. Daily summary plots are available on the web of the BAS data, which is linked off the VERSIM website.

In addition there are OmniPAL Trimp-type receivers in Finland and Svalbard operated by Mark Clilverd, plus a VLF Doppler experiment at Rothera (Antarctic peninsular) that

monitors VLF whistler mode signals from VLF transmitters in the conjugate region. It was noted that the northern narrow-band receivers are monitoring some European and might be useful in the planned European sprite campaign in ~July 2004. VLF receivers also undertake measurements on 2 operational Antarctic AGO stations located between Haley and South Pole. BAS is developing a chain of VELOX receivers aimed at substorm research. These are being deployed at almost constant latitude but ranged over longitude. They have 3 of those receivers in operation now in Sodanklyä, Finland, Casey in Antarctica, and near Churchill and Canada, and we are just about to deploy a station in Alaska.

**France** Michel Parrot reported on LPCE's most imminent microsatellite project, DEMETER. The launch date will be around the end of March 2004 from Baikonur on a Russian rocket with a polar orbit at 710 km. Payload testing is now underway. There will be a call for guest investigators with information to come in around the beginning of November. The results of this call will be published end of March shortly before launch.

In addition, this group will be deploying a wideband VLF receiver (up to 50 kHz), close to Orleans, in the forest to the south of city. This receiver is being supplied by Umran Inan (Stanford), and will be used to support European sprite observations in July 2004, plus DEMETER observations. It will initially be used for campaign recordings, with the data passed to Stanford for analysis.

**Greece** Christos Haldoupis reported on a narrow-band VLF receiver which is to be deployed in Crete to monitor several VLF stations in Northern and Western Europe. This location is favourable for the red sprite campaigns to be undertaken in Europe, particularly given lightning activity levels in the Adriatic. The receiver is from Stanford, and the data will be passed to Stanford for analysis.

**New Zealand** Craig Rodger reported that the University of Otago group was undertaking long term recordings by Neil Thomson's Doppler experiment which runs every night plus continuous OmniPal/AbsPal narrowband recordings looking at transmitters in our region. The group is undertaking experimental and theoretical work on electron and proton precipitation, both the effects on the ionosphere and the implications of this precipitation as a loss mechanism from the radiation belts. Neil Thomson in particular is continuing his efforts at looking at solar flares and their effects on the ionosphere particularly the D region. In addition this group is operating campaign based wideband VLF recordings with the IMAGE satellite every 22-days and undertook campaign wideband recordings in association with passes of the Kolibri nano-satellite launched from the ISS in 2002.

He also reported that Richard Dowden's VLF lightning detection network is growing. There are currently 11 partner institutions in this network, of which the University of Otago group was one. There are firm plans to add stations in Fiji, India, another station in the US, another station in Brazil, possibly a station in Peru. The network is growing quite quickly and quite successfully, and provides real practical data for use in related experiments. At the IUGG conference there was a report on the Israeli sprite hunting

experiment from the US space shuttle who used the web based lightning maps from this network to orient the shuttle towards probable thunderstorm locations (6 hours in the future). Currently historic data access is available to the hosts, and other institutions should discuss data access with the PI, Dick Dowden. As the network development has not been supported by government grants, there may be some costs for data access, although maps are available on the web.

#### Symposia at future IAGA and URSI Assemblies:

It was decided that the working group would not suggest any sessions for future IAGA meeting to be held in Toulouse in 2005. Sessions relevant to VERSIM on "ULF/ELF/VLF impacts on the radiation belts" are to occur at the 2005 URSI General Assembly (New Delhi, October 2005). It was felt that we didn't want to overload people at this stage, and confidence that the IAGA Division III business meeting will produce sessions relevant to our science.

#### Election of the VERSIM IAGA co-chairman:

Andy Smith has previously signaled to the working group that he does not wish to carry on as the IAGA co-chairman of the group. At this business meeting Craig Rodger (New Zealand) was nominated to take up this role, and elected to the role. This information was passed onto the chairs of the IAGA commissions during the IUGG meeting. The website and mailing list will be transferred to New Zealand.

#### Other business:

##### **IAGA Guides**

Our working group has been contacted by Charles Barton (IAGA vice-president) concerning IAGA Guides. IAGA is now producing 3 guides on the topics of Noctilucent Clouds, Magnetic Observatories, and Magnetic Repeat Station Surveys. These guides are intended to provide practical advice about IAGA-recommended methodologies and standards. This type of information seldom appears in scientific journals. The guides may contain some scientific review but this is not their main purpose, and they are not intended to compete with scientific review journals. It has been proposed that the VERSIM community may wish to suggest a new IAGA guide. One topic suggested in the communication was Solar-terrestrial interaction/space weather/climate change, although this is only a suggestion, the community may wish to recommend an entirely different topic (and propose authors to undertake the project).

It was decided at the business meeting to pass the question of new IAGA Guide topics to the VERSIM community via the email list.

##### **Upcoming Meetings**

Craig Rodger reported that there is to be a Summer School held in Corsica on "*Sprites, Elves and intense Lightning Discharges*", during the northern hemisphere summer of next

year (21-30 July, 2004). The Summer School is primarily funded by NATO and the European Science Foundation, with the intention that it is to be a true teaching environment providing opportunity for people to come along to get an understanding of the interlinked but disparate scientific areas relevant to this field of study. There are to be lectures and practical sessions from "experts" in the field, quite a number of whom are VERSIM members. The Summer School should produce a textbook aimed at getting say-MSc level people quickly up to speed with the techniques and jargon.

Those interested should register (there is no registration costs for NATO member countries). Further information can be found on the webpage, which is to be linked off the VERSIM webpage.

**Vote of thanks to the Outgoing Co-Chair**

The incoming IAGA co-chair proposed a vote of thanks on behalf of our working group to Andy Smith for all of the efforts he has undertaken to support the VERSIM community. This was supported by the meeting, and is surely agreed by the rest of the working group who could not attend.