Newsletter

Volume 1, Number 1[1,2]
August 7, 2009

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1. Message from ULTIMA Chair

This international scientific organization was born on Nov. 17, 2006, on the campus of UCLA. Although it is still modest in size, I believe it provides an increasingly important service to the scientific community because ULTIMA is the only "array of (magnetometer) arrays" in the world.

I would like to take this opportunity to repeat here the Preface of our *Bylaws*:

ULTIMA is an international consortium that aims at promoting collaborative research on the magnetosphere, ionosphere, and upper atmosphere through the use of ground-based magnetic field observatories. ULTIMA is composed of individual magnetometer arrays in different countries/regions, and it provides a platform for each of them to easily and efficiently collaborate with other arrays in order to expand observational coverage. ULTIMA also helps identify the importance and needs of individual arrays to continue operation or establish new stations in their host countries.

I encourage you to rediscover our "purpose" by reading Article 1 (name and purpose) of our *Bylaws*. It can be downloaded as pdf from the official website (Editor's note: listed in footnote 1). The website also has the current list of ULTIMA members. Please contact us if the website needs some error correction.

Prof. Kiyohumi Yumoto
Space Environment Research Center (SERC)
Japan

2. Minutes of 2008 ULTIMA Annual Meeting, Tsukuba, Japan

The 2008 ULTIMA Annual Meeting took place at the Advanced Industrial Science and Technology (AIST) in Tsukuba, Japan on November 14, 2008, immediately after the

[1] Each issue of the ULTIMA Newsletter is first sent out as pdf to ULTIMA members via email; then later it is made available at the ULTIMA website, which is: http://www.serc.kyushu-u.ac.jp/ultima/ultima.html. Note that this website provides a rough history of this organization through its annual meetings, which are required because of the bylaws of the organization.
[2] Draft made by P. Chi on July 20, 2009; Revised by K. Yumoto and G. Maeda on Aug 1, 2009

IGY+50 Symposium held at the same venue. The meeting was joined by 11 ULTIMA members (Fraser, Kawano, Maeda, Vellante, Walker, and Yumoto were in Tsukuba; Chi, Engebretson, Mann, Milling, and Russell joined through telecon) and over a dozen participants of the International Workshop for Lithosphere Environment Change in Asia (IWSLEC) Meeting whose research interests include the geomagnetic field.

The ULTIMA Chair Kiyo Yumoto started the meeting by welcoming all the participants. The presentations afterward are divided into two parts. The first part is the report from each member magnetometer array, and the second part focuses on scientific studies using ground magnetometer data.

Kiyo Yumoto reported the status of the MAGDAS magnetometer array. In particular, MAGDAS-II installations in Africa were made in Nigeria, Zambia, South Africa, Sudan, Mozambique, Kenya, and Tanzania during September of 2008 (start of the 96 deg. Magnetic Meridian Chain). It was suggested at the end of the report that MAGDAS and UCLA's AMBER magnetometer array (PI: Endawoke Yizengaw) could exchange the latest progress in Africa.

(Note: Professor Yumoto is widely known for having established the 210 deg. Magnetic Meridian Chain in Asia, which is a large array running north and south of Japan. Next, he established a chain along the dip equator. Last year, the next chain was established: the 96 deg. Magnetic Meridian Chain, which runs up and down the length of Africa.)

Massimo Vellante gave the first report of the SEGMA array to ULTIMA. SEGMA consists of three stations in Italy, one in Hungary, and one in Bulgaria, and the IWF in Austria is also a collaborator for instrumentation. All five stations are equipped with a fluxgate magnetometer, and L'Aquila (Italy) and Panagyurishte (Bulgaria) stations also run an induction magnetometer. The SEGMA web server at

(http://sole-terra.aquila.infn.it/staz_segma.asp?lang=en)

provides both user-defined magnetograms as well as cross-phase spectrograms for field line resonance analysis.

Ray Walker gave a progress report on the NASA Virtual Magnetospheric Observatory (VMO) project. VMO is an important interface between the scientists and data providers in the new Heliophysics data environment, and it adopts the SPASE metadata standard. VMO pledges to provide online resources (metadata) for ground magnetometer data, and it can help ULTIMA members to generate metadata for their magnetometer arrays. As a part of the VMO team, Peter Chi can help all ULTIMA members make use of VMO.

Brian Fraser reported on the Australian Antarctic Magnetometer Network (AAMN) contribution to ULTIMA. AAMN has six search-coil induction magnetometers distributed in Macquarie Island and Antarctica. Data in H and D have been recorded continuously since 1994. Data files (including dynamic spectra) are currently available by request to Brian.

Ian Mann introduced the extension and upgrades of the CARISMA Magnetometer Array. CARISMA has funding to add 15 fluxgate magnetometers, and 11 of them have been deployed. The upgrades include local data logging capabilities and return data at the fluxgate magnetometers native rate (8 Hz) through a high-speed satellite broadband link. One-sample/sec standard data (from April 1, 2005) are available at the Canadian Data Portal (http://www.cssdp.ca/). Induction coil

and 8 samples/sec fluxgate data are available on request from the PI (Ian).

Mark Engebretson gave a status report on the MACCS magnetometer array. The MACCS web site at http://space.augsburg.edu/space gives access to both recent near-real-time data and plots from two stations (Nain and Cape Dorset) and processed 5-s averaged data from earlier years. Over half of MACCS sites have been upgraded to new Linux-based computers that are capable of near-real-time data transmission, but limited funds have not allowed any additional sites to begin transmission in near real time this year. All MACCS operations are now centered at Augsburg College. David Murr has now replaced Jeff Hughes as Co-PI of MACCS. David began work as an Assistant Professor of Physics at Augsburg College in September 2008.

Peter Chi gave a status report on the McMAC array and also went over the data servers for IGPP-LANL and THEMIS ground magnetometer arrays. McMAC data are available online in ASCII, Matlab, and IGPP flat file formats

(see http://www-ssc.igpp.ucla.edu/mcmac/data/).

These data, in addition to the IGPP-LANL and THEMIS ground magnetometer data, can also be accessed through VMO. Peter also introduced a new project named "Falcon" that he has been working in collaboration with the Air Force Academy. Falcon will place at least six new systems at strategic locations in the United States that extend the coverage of field line resonance measurements.

The above status reports of ground magnetometer arrays are followed by several scientific presentations. Many presentations focused on the Whole Heliosphere Interval (WHI: March 20-April 16, 2008) and the three events – magnetic storms on November 20, 2007 and March 9, 2008 and a sudden impulse event on December 17, 2007 – selected before the Annual Meeting. Publications of these studies were suggested. The slides of the science presentations along with status reports on magnetometer arrays can be found at the ULTIMA web page:

http://www.serc.kyushu-u.ac.jp/ultima/2008meeting/ULTIMA2008.htm.

Also discussed at the meeting are several important plans to assist the activities of ULTIMA:

1. Members contributed ideas about the venue and time for the next ULTIMA Annual Meeting, such as a joint meeting with the GEM Workshop, the IAGA 2009 Meeting, and the IRI Meeting in November 2009. The discussion ended with the selection of San Francisco on the day before the Fall 2009 AGU Meeting where many members will attend.

2. Even though no new member was recommended at the meeting this year, possible future invitations to Prof. Lakhina in India and Greenland Magnetometer Array were mentioned.

3. ULTIMA Chair Kiyo decided to launch an ULTIMA Newsletter periodically to facilitate information exchange among members. Secretary Peter Chi and Assistant Secretary George Maeda will be responsible for issuing this newsletter.

3. Discussions at 2009 Joint Assembly, Toronto, Canada

A special session on "Ground Magnetometer Arrays in the New Millennium" was held at the Joint Assembly in Toronto, Canada during May 24-27, 2009. The conveners of this special session are Martin Connors

(Athabasca University, Canada) and Chris Russell. In addition to Chris, ULTIMA members Kiyo Yumoto, Eftyhia Zesta, and Peter Chi joined this session in Toronto.

During the 2009 Joint Assembly a meeting was also held among Kiyo Yumoto, Jesper Gjerloev (JHU/APL, PI of SuperMAG), Martin Connors, and Peter Chi. Sponsored by NSF and NASA, SuperMAG builds and manages an online server for the data collected by a dozen ground magnetometer arrays. The meeting drew a blueprint for future collaboration between ULTIMA and SuperMAG, and the following agreements and future plans, including those for collaborating with SuperMAG and improving magnetometer networks, have been proposed:

1. To invite Jesper Gjerloev to ULTIMA as an Observer at the next annual ULTIMA meeting;

2. To include description about the different roles of ULTIMA and SuperMAG at the SuperMAG web site;

3. To include "rules of the road" for the use of magnetometer data at the SuperMAG data server;

4. More discussions should be made on formats for ground magnetometer data;

5. For the need of maintaining magnetometer operation in developing countries and securing future government support, we should devise plans to urge data users to include station managers and PI of magnetometer arrays in publications. More discussions on this topic can be made at upcoming ULTIMA meetings.

Peter Chi also recommended an invitation to Martin Connors as a new ULTIMA member at the next annual meeting. Martin Connors is the PI of the AUTUMN magnetometer array in Canada.

4. ULTIMA Meeting 2009

At the 2008 ULTIMA Meeting in Tsukuba, members have expressed preference to hold the 2009 Annual Meeting the day before the Fall 2009 AGU Meeting in San Francisco. As GEM also holds its annual Mini-workshop in San Francisco on the same day, the discussed plan also includes a joint meeting with the GEM Mini-workshop.

At a GEM Steering Committee (SC) meeting in December 2008, ULTIMA Secretary Peter Chi proposed to the GEM SC the idea of a joint meeting with GEM in 2009, and the GEM SC gave a positive response to the proposal. Recently the GEM Workshop Coordinator Bob Clauer (Virginia Tech, USA) also kindly agreed to pay for the cost of the meeting room for the ULTIMA Meeting.

So please mark your calendar for the 2009 ULTIMA Annual Meeting: **Sunday, December 13, 2009, San Francisco, California**. The venue and agenda will be provided in October if not sooner.

5. Next issue of ULTIMA Newsletter

In the next ULTIMA Newsletter (Vol. 1, No. 2) we will report updates from the IAGA Meeting to be held in Sopron, Hungary during August 23-30, 2009. At all times, we welcome contributions from members regarding the latest news of ground magnetometer arrays.

Comments and suggestions can be sent to ULTIMA Secretary Peter Chi at pchi@igpp.ucla.edu