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 差出人 maeda@serc.kyushu-u.ac.jp

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* ISWI Newsletter – Vol. 3 No. 57                21 June 2011 *
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*           I S W I = International Space Weather Initiative    *
*                   (www.iswi-secretariat.org)                  *
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* Publisher:      Professor K. Yumoto, SERC, Kyushu University, Japan *
* Editor-in-Chief: Mr. George Maeda, SERC (maeda[at]serc.kyushu-u.ac.jp)*
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Attachment(s):

- (1) "Zambia presentation", 1.8 MB pdf, 7 pages.
- (2) "Fred Nambala at SERC", 630 KB pdf, 1 page.

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:                               Re:
:                               Good example of Capacity Building
:                               in Africa.
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Dear ISWI Participant:

One of major assumptions of ISWI is that if you want to do lots of serious space science, then you cannot exclude ground observation efforts. I am quite aware that many scientists believe only space-based observation -- using satellites -- is necessary. For them ground observation is "erratic", or "difficult", or "just not worth the trouble", or other explanations of evasion.

However, ISWI assumes that global ground observation is necessary (but not sufficient) for serious space weather investigations. Perhaps it is difficult, but it is nonetheless essential.

To make global ground observation long-term and self-sustaining, it is necessary to bring together instrument providers and instrument hosts. This is a major agenda of ISWI/IHY/IGY.

But instrument hosts want to understand what is going on. To do that, instrument providers must undertake some "Capacity Building" for the hosts. Certainly, the MAGDAS Project, here at SERC at Kyushu University in Japan, believes that strongly. The main components of Capacity Building are:

- <1> Build up the ability to maintain observational instruments.
- <2> Build up the ability to analyze the data generated by them.
- <3> Build up the ability to publish results from such data.

As part of our Capacity Building program within the MAGDAS Project, we are training talented young people to do Items <1>, <2>, and <3> mentioned above. For example, Mr Fred Nambala (lecturer at a university in Zambia where we have MAGDAS in operation) has been with us for one month to receive a bit of Items <1>, <2>, and <3>.

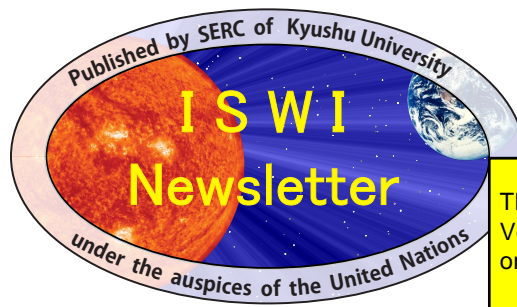
I attach his seminar presentation (7 pages) and a photo of him with SERC staff and students (1 page). He wound a Helmholtz coil, which took 20 hours of dedicated work.

This year August, to do more of Items <1>, <2>, and <3>, Prof. Yumoto (PI of the MAGDAS Project) is organizing MAGDAS School in Nigeria. Info on this school can be found at the Official ISWI Website (www.iswi-secretariat.org).

Please send to me your Capacity Building enterprises.

Humbly yours,

: George Maeda
: The Editor
: ISWI Newsletter



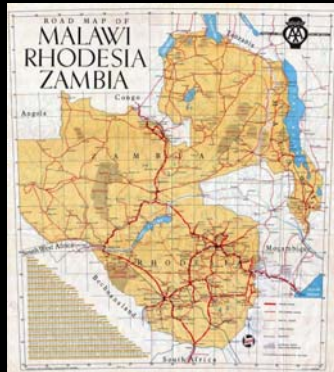
This pdf was circulated in
Volume 3, Number 57,
on 19 June 2011.

The attached slides were presented by Mr Fred Nambala at a seminar at SERC, Kyushu University, Japan, on 16 June 2011.

Mr Nambala came to SERC for about one month to receive training on MAGDAS. He is a lecturer at the University of Zambia, Lusaka, Zambia.

Facts

- Zambia is in Southern Africa, Africa, Earth, Milky-way Galaxy, Universe
- Has a population of about 13.6 million people according to the 2010 AD Census
- Territory is about 750,000 km²
- Has 8 neighbouring countries namely Angola, Botswana, Congo Kinshasa (DRC), Malawi, Mozambique, Namibia, Tanzania, Zimbabwe
- Was once in a Federation called Rhodesia (Northern Rhodesia = Zambia; Southern Rhodesia = Zimbabwe) and Nyasaland (Malawi)

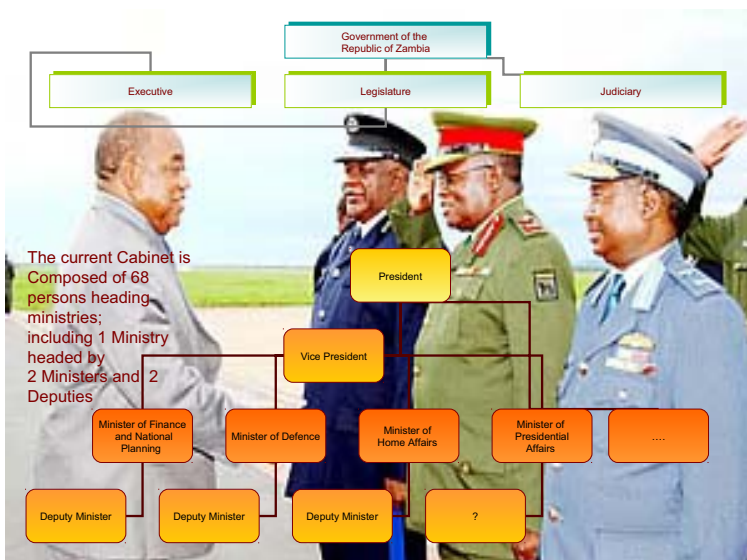


Politics

- Since Independence on October 24, 1964, the Nation has had only 4 Presidents
- Started as a multi-party democracy
- 1972, it became a 1 party democracy
- 1990, multi-party democracy again
- Declared a Christian Nation in 1992
- Now there are 3 major out of about 30 political parties namely:
 - Movement for Multi-party Democracy (MMD)
 - Patriotic Front (PF)
 - United Party for National Development (UPND)
- Another one of significance is United National Independence Party (UNIP) was the first to form Government
- The rest are more or less fitting to be called piggy-backs



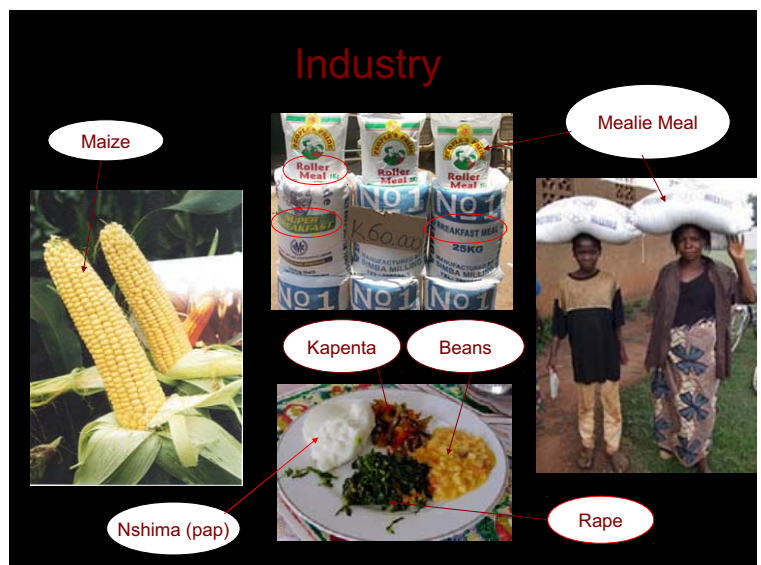
The Republic of Zambia



Zambia – the Real Africa

- Zambia derived its name from the Zambezi river – which is the largest running from the Kalena Hills in North-western Province through to the Indian Ocean
- Initially named Northern Rhodesia as a colony of the Great Britain
- The current name came into effect when the then Northern Rhodesian people obtained Independence in 1964 becoming Zambians





Politics New Culture



Urban Life



UNZA



- The University of Zambia was opened in 1966
- Has about 8 Schools/Faculties: Medicine, Veterinary Medicine, Natural Sciences, Mines, Engineering, Law, Humanities and Social Sciences, Education
- I belong to the School of Natural Sciences under Physics Department

Rural Life

- Heading of cattle
- Raring of chicken, Goats, etc
- Subsistence farming
- Hunting for meat
- Collecting fruits and vegetables
- Tradition clothes making
- Fishing



Physics Dept Members

Name	Teaching course codes	Research field	
Prof. Prem C Jain	P361/ P485,	Energy & Environmental Physics	On leave
Prof. Pan N KALOYEROU	MP 415/ P455/ P452, P351/P332	Quantum foundations and theoretical physics	
Dr. Muhammad M HUSSAIN	P191/192/ P198, P261/ P212, P411/ P412.	(1) Neutron cross-sections (2) Trace element analysis using proton induced x-ray analysis (3) Measurement of radon in Zambian copper mines.	
Dr. Habatwa V MWEENE	P 251/P252, P351/ P332, MP 415/P455/P452	Quantum foundations and theoretical physics	
Dr. Geoffrey MUNYEME	P 251/P252, P231/ P272, P485,	1. Materials Science 2. Energy & Environmental Physics	On leave
Dr. Adrian HABANYAMA	P 251/P252, P421/ P422	Material Science.	On leave
Dr. Sylvester HATWAMBO	P191/192/ P198, P261/ P212, P485,	Energy & Environmental Physics	
Dr. Rekha RAJAN	P231/ P272, P341/P342, P441/P442	1. Electronics 2. Aerosols	
Dr. Kabumbwe HANSINGO	P302/P401	Weather and climate physics	
Dr. Patrick SIBANDA	P361	Space Physics (Ionospheric physics)	New
Mr. Gershom M CHISHIMBA	P191/192/ P198, P411/ P412	Radiation Technology and Waste Management	
Mr. Peter C KALEBWE	P191/192/ P198, P261/ P212, P341/P342, P441/P442.	Applied Radiation Physics	
Mr. Dominic J MBEWE	P231/ P272, P341/P342, P441/P442	Biofuels Production	
Mr. Steven MUDENDA	P 251/P252, P421/ P422.	Material Science.	
Mr. Fred Joe NAMBALA	P 251/P252, P485.	Space Physics (Ionospheric tomography).	New
Mr. Nchimunya MWIINGA	P231/ P272, P361/P485	PhD student in Space Physics (i.e. heliospheric physics) – NWU, South Africa.	

Culture



- Traditional Ceremonies:
- Kuomboka
- Lwiindi
- Mutomboko
- Nc'wala

Calibration

Adjusting stage



Adjusting sensor

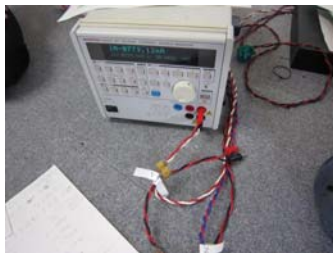


Calibration

Setting Sensor



Current source for Helmholtz Coil



Coil Constant Expt

Coil in Vertical position



Recording results



... Continued

Apart from the above list of Lecturing staff, the Physics Department through University policy programme has the following Staff Development Fellows

Below is a list of UNZA's SDFs (i.e. Staff Development Fellows) in physics		
Name	Field of Interest	Status
Ms. Lister MULINDWA	Condensed Matter	PhD student - Canada
Mr. Geoffrey CHANDA	Supper Conductors	PhD student - Germany.
Mr. Michael MWALABA	Condensed Matter	Has a Pre-PhD Diploma from ICTP, Italy - looking for PhD scholarships.
Mr. Nathan PUMULO	Quantum Information	Recently completed M.Sc. at UKZN, South Africa
Mr. Nyambe WAMUNYIMA	Quantum Information	M.Sc. student - UKZN
Mr. Bernard MULILO	Nuclear Physics	M.Sc. student - South Korea
Mr. Gift SICHONE		Soon leaving for M.Sc. in China.
Mr. Mark SHAWA		Looking for M.Sc. and PhD scholarships
Mr. Shupe SIAME		Looking for M.Sc. and PhD scholarships
Mr. Vernon CHISAPI	Nuclear Physics	Looking for M.Sc. and PhD scholarships

SERC - MAGDAS Trip

Starting of winding



Progress of winding



Installations and Coil building

MAG 9 Installations



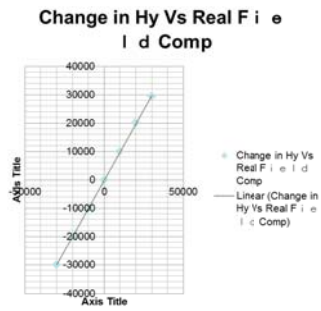
Coil Winding



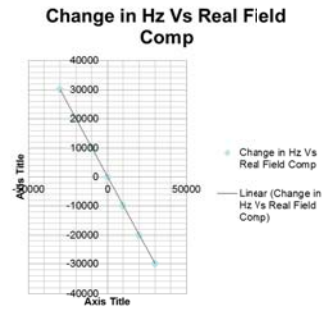
H, D and Z components

Coil Constant expt

Hy Results



H_z Results



Inclination change



Readings from Monitor

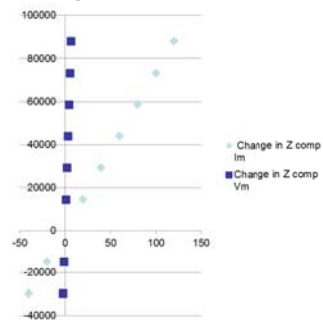


Coil Constant Calculation

Values recorded

ΔHZ (nT)	Observed Field	I_m (mA)	V_m (Volts)
-29856.2	61856.24	-40.05	-2.25
-15084.3	47144	-20.06	-1.139
14352.5	17707.19	19.962	1.084
29101.22	2957.83	39.49	2.197
43820.46	-11761.6	60	3.31
58530.79	-26471	79.99	4.42
73248.88	-41190.9	99.99	5.53
87978.9	-55928.1	120.04	6.64

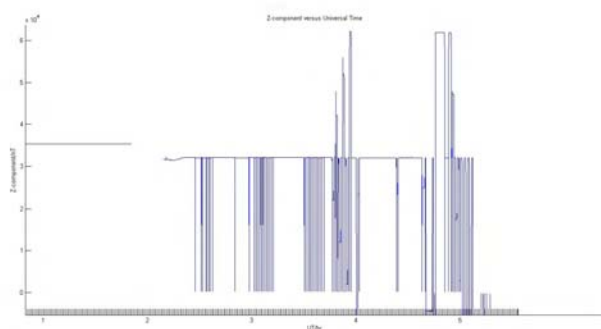
Change in H_z Vs I_m/V_m



Mag 9 No. 25 returning



MAG 9 Data plot



H, D and Z Components

Data Collected

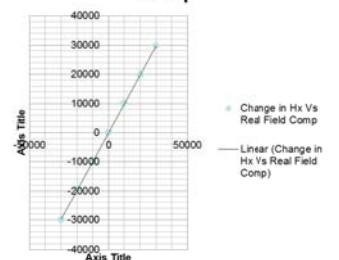
X component Field putting through current source

12:00 Hr steps of 1minute interval

Real Field I_m (mA)	HX (nT)	ΔHX (nT)	C. Const * I_m	Ratio
0	500.02	28675.05	19253.27	0
10000	259.74	38696.97	10021.92	1.002063
0	259.74	28676.5	-10020.5	10001.29
-10000	259.74	18618.1	-10058.4	10001.29
0	259.74	28871.11	10253.01	1.025169
20000	519.4	48732.76	19861.65	19999.5
0	519.4	28056.13	-20676.6	19999.5
-20000	519.4	8579.21	-19476.9	19999.5
0	519.4	28911.13	20331.92	19999.5
30000	779.04	58769.19	29858.06	29996.94
0	779.04	28456.54	-30312.7	29996.94
-30000	779.04	-1453.07	-29909.6	29996.94
0	779.04	28456.54	29909.61	29996.94

Analysis

Change in H_x Vs Real Field Comp



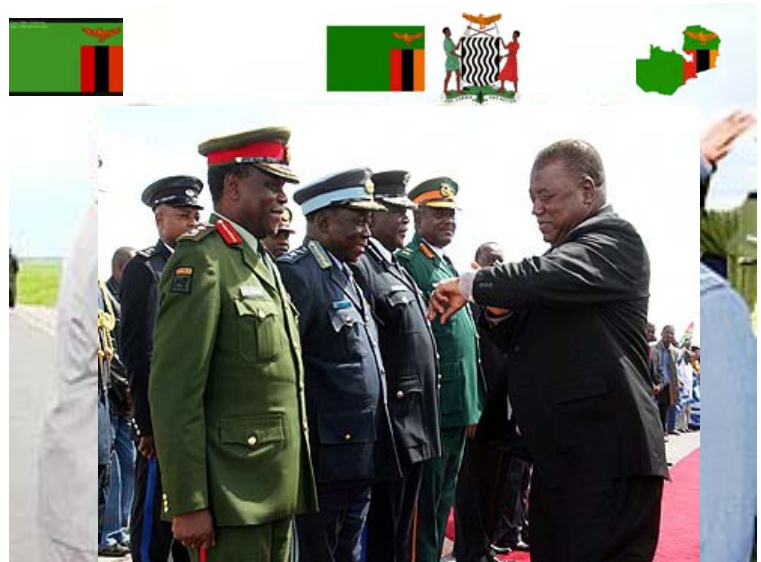
Calibration Coil Constant

Calibration Helmholtz Coil Constants

- With 2A current source of X, Y and Z components
- 77010 nT in X
- 83897 nT in Y
- 71450 nT in Z

Coil Constants

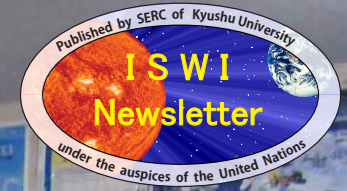
- 13249.74 nT/V
- 7353.94 nT/mA
- Or 735393.98 nT/A



Thank you for your invitation and attention

ARIGATO, GOZAIMASU

The "Back Room" of SERC, Kyushu University, Hakozaki Campus, Fukuoka, Japan.



Mr. Fred Nambala (University of Zambia) with SERC staff and students on 17 June 2011 after monthly MAGDAS Meeting at SERC.