Abstract Project- preliminary- 2004

The Geomagnetic Quakes as Reliable Earthquake Precursor- Beijing, Lanzhou regions, 2004

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China geophysicists, seismic earthquake data

China geophysicists, vector geomagnetic data, Beijing and Lanzhou geomagnetic observatories

The impressive development of the Earth sciences on the basis of new precise Crust condition parameters measurements permits to estimates the probabilities for earthquakes risk. But the prediction the time, epicentre and Magnitude of incoming earthquake is not a solved problem. Many scientists are state that this is not solvable. Such pessimism is right because of very scare time and space set of Crust movement parameters monitoring and the uncertainties of our today knowledge for the Earth and its magnetic field. The local "when" Earthquake prediction is based on the connection between geomagnetic "quakes" and the next incoming minimum or maximum of tidal gravitational potential. The probability time window for the predicted earthquake is +/-1 day for the minimum and +/-2 days for the maximum. The preliminary statistic estimation on the basis of distribution of the time difference between predicted and occurred earthquakes for the period 2002- 2003 for Sofia region and for Beijing and Lanzhou regions are given. The solving of earthquake's prediction problem and creating its theory need the efforts of wide interdisciplinary science group from physicists, geophysicists, seismologists, Earth geomagnetism theory, Atmosphere and near space physics, biologists, the application of temporary almost real time GIS for data acquisition, visualization, archiving and analysis, the new possibilities for solving step by step the nonlinear inverse problems for testing the adequateness of physical models and the reliability of predictions. The monitoring should include standard geodetic data, seismic hazard map developments, electromagnetic field monitoring under (electrical signals in VAN method and its Thanassoulas's variant), on (electropotential distribution, geomagnetic variations) and over (VLF and ULF, vertical electropotential distribution) Earth surface, atmosphere effects (earthquake's clouds, electrical charge distribution), the behaviour of Earth radiation belts, biological precursors. The statistical estimation for reliability of time, epicentre and magnitude prediction is obligatory. The Beijing- Lanzhou regions are proposed as polygon for testing the possibilities for creating research and short time earthquakes prediction NETWORK. The important advantage of the proposal is that the geophysical seismic, geomagnetic, atmosphere and near space monitoring exists and the research needs more software than hardware for testing the approach and applying it in the practice. The main trouble is not only the scepticism of the part of science community but also the governments and municipalities authority's problems with practical using of the predictions for preventing

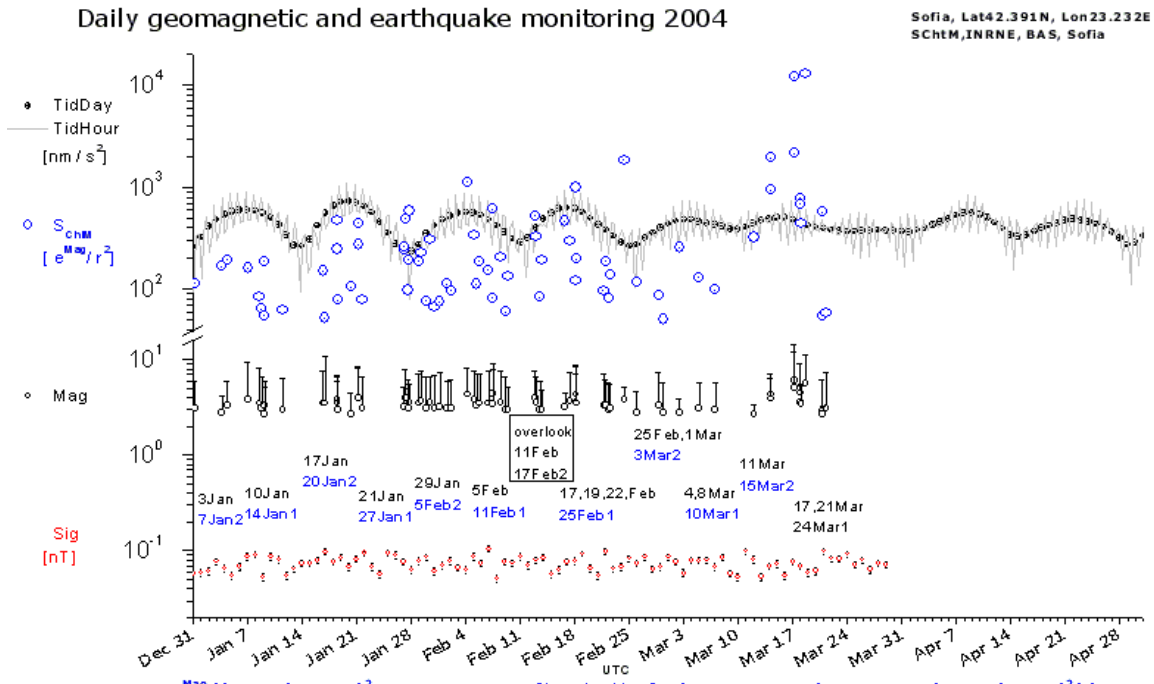
of the hazards consequences and the restoration of the environment. The creating of wide international science group for every earthquake region can accelerate the solving of this complex from science point of view and with high social meaning problem.

1. Introduction- short history of the developments of earthquake predictions results

1.1. Earthquake precursors- seismic, electromagnetic under on and over Earth surface, atmospheric, Earth radiation belts anomalies, biological

2. Geomagnetic quake as reliable earthquake precursor

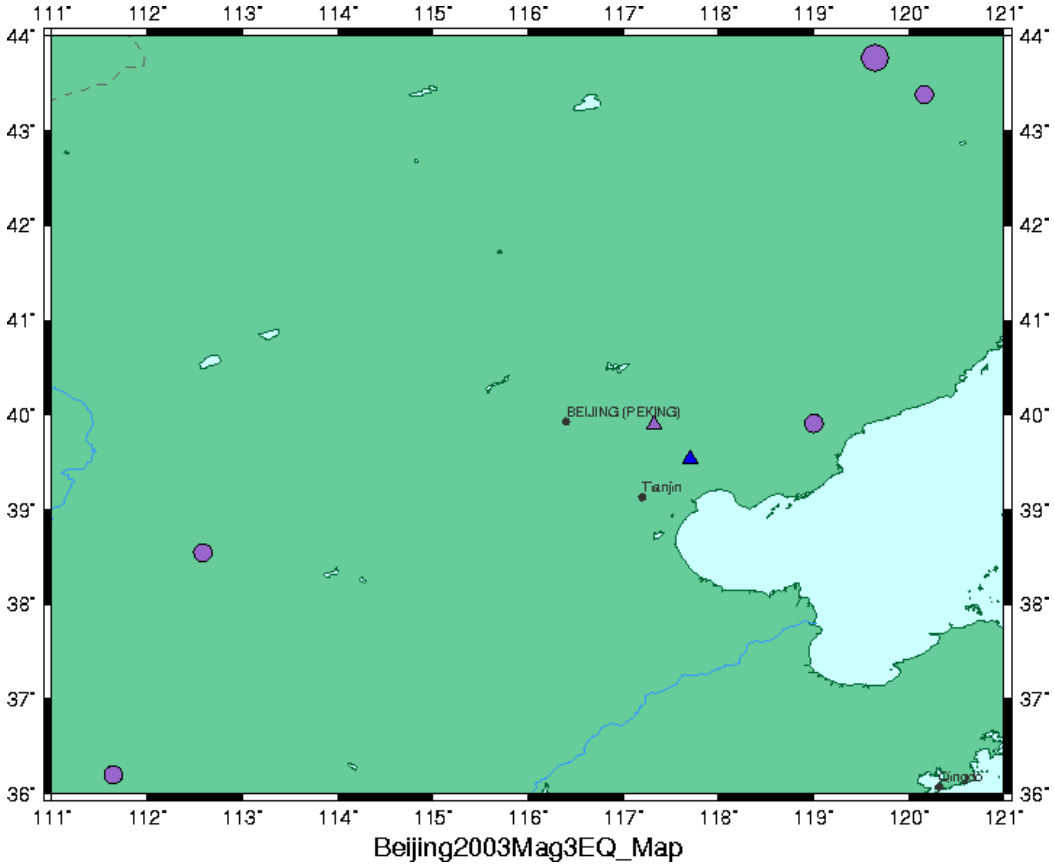
2.1. Sofia region



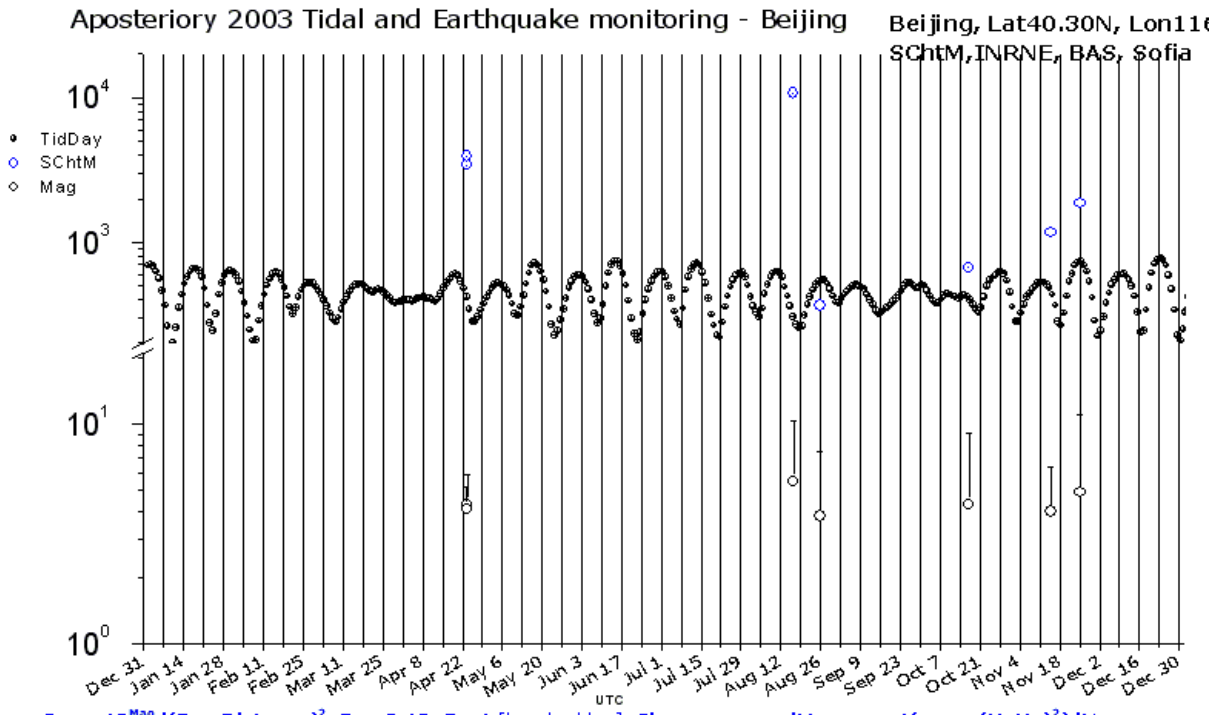
$S_{ChtM}=10^{Mag}/(R_{eq}+Distance)^2$, $R_{eq}=0.40+Dept$ [hundred km], $Sig = \Sigma_{m=1,M}\ \sigma_{H_m}/M$, $\sigma_{H_m}=sqrt(\Sigma_{i=1,N}(H_i-\underline{H_m})^2)/N$, $\underline{H_m}=\Sigma_{i=1,N}H_i/N$, where H_i is the geomagnetic vector projection, measured 2.4 times per second, M=1440, N=144.

The earthquake precursor (geomagnetic quake) is Sig "irregularity". The vertical error of Mag is distance [Hundred km]. The approximate time window for incoming event is defined from the next Tidal potential (Venedikov et al model) minimum (+/-1day) or maximum (+/-2). EQ data from http://wwwneic.cr.usgs.gov/neis/bulletin/ and GPhI,BAS,Sofia. Reliability time control http://www.emsc-csem.org/. The predicted dates are in BLACK, the confirmed- in BLUE.

2.2. Beijing region



Beijing2003Mag3EQ_Map



$S_{ChtM}=10^{Mag}/(R_{eq}+Distance)^2$, $R_{eq}=0.40+Dept$ [hundred km], $Sig = \Sigma_{m=1,M}\,\sigma_{H_m}/M$, $\sigma_{H_m}=sqrt(\Sigma_{i=1,N}(H_i-\underline{H}_m)^2)/N$,
$\underline{H}_m = \Sigma_{i=1,N}H_i/N$, where H_i is the geomagnetic vector projection, measured 2.4 times per second, M=1440, N=144.

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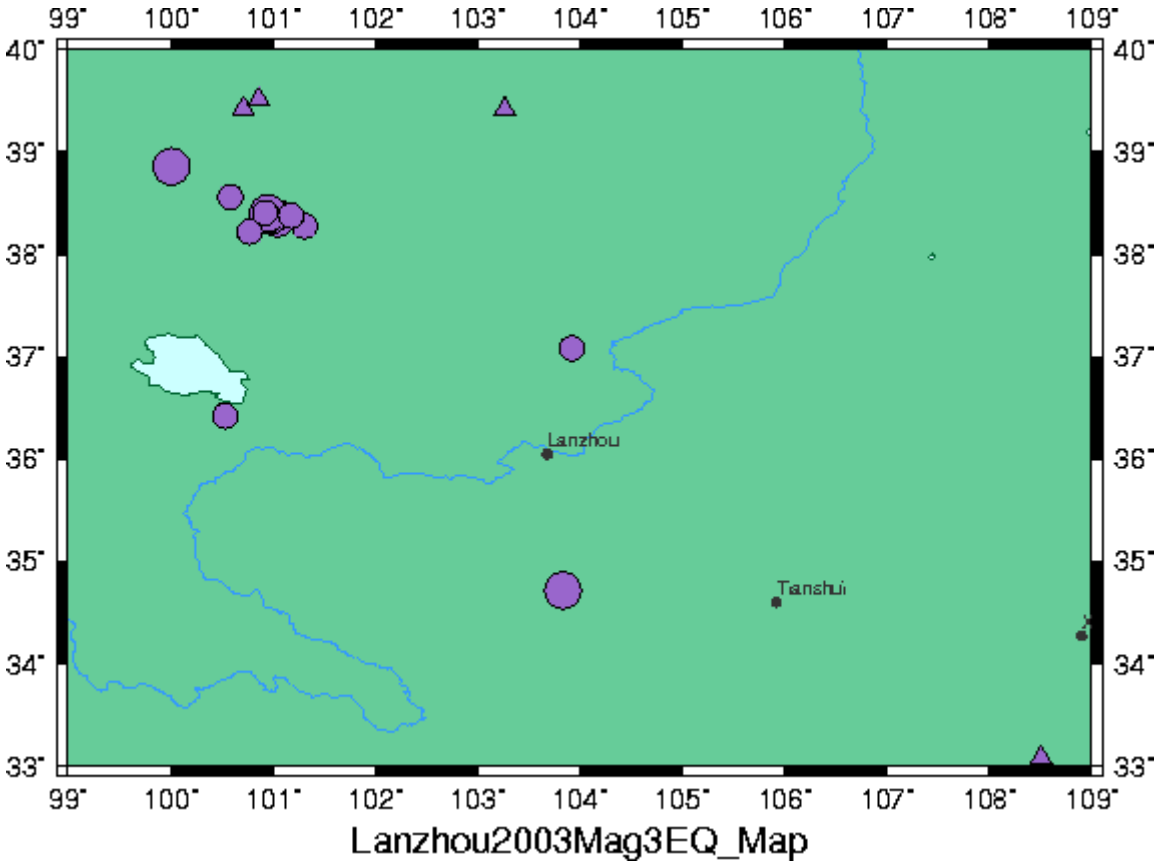
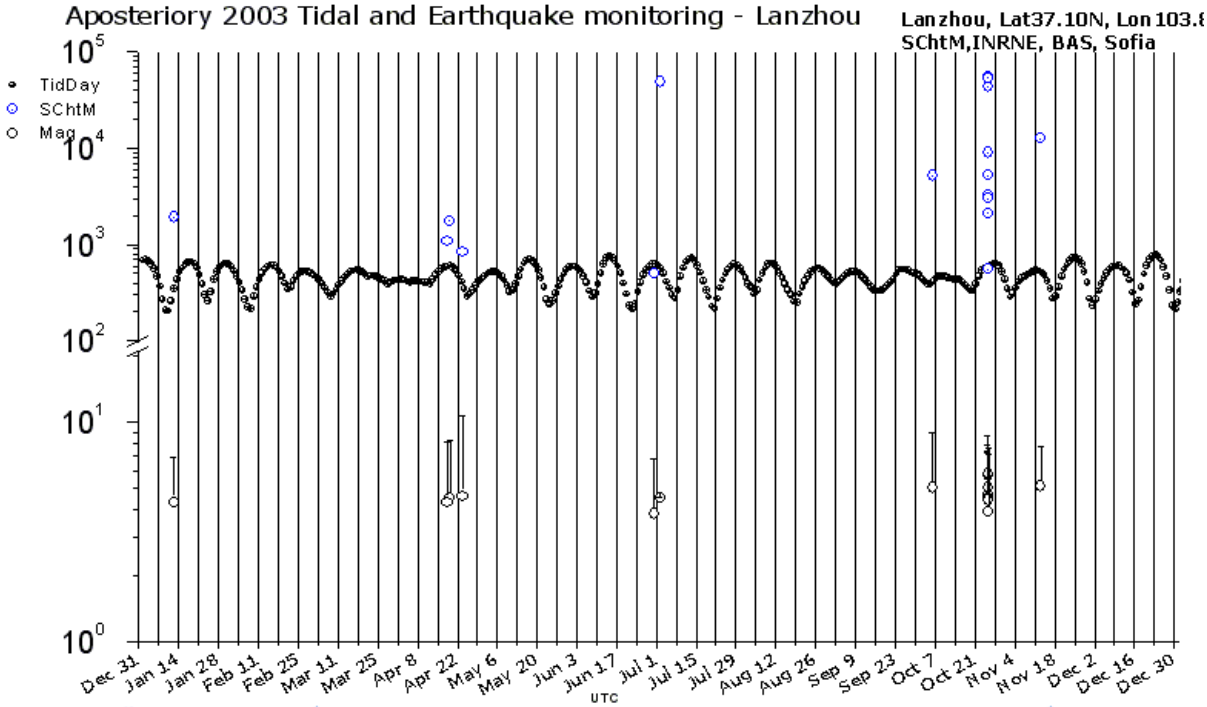
2.3. Lanzhou region





$S_{ChtM}=10^{Mag}/(R_{eq}+Distance)^2$, $R_{eq}=0.40+Dept$ [hundred km], $Sig = \Sigma_{m=1,M}\,\sigma_{H_m}/M$, $\sigma_{H_m}=sqrt(\Sigma_{i=1,N}(H_i-\underline{H}_m)^2)/N$,
$\underline{H}_m=\Sigma_{i=1,N}H_i/N$, where H_i is the geomagnetic vector projection, measured 2.4 times per second, M=1440, N=144.

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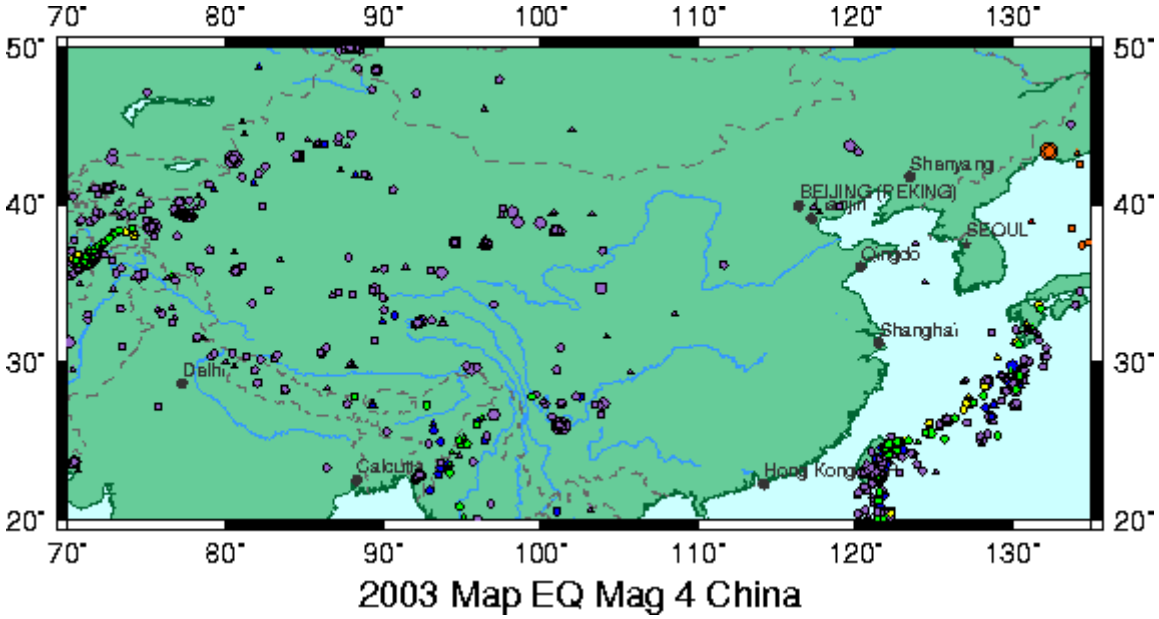
3. Proposal for earthquake research and prediction NETWORK



2003 Map EQ Mag 4 China

4. Conclusion

References

The analysis of the last China, Sichuan earthquake:

20080512 06:28:0.08 Lat 31.02 Lon 103.37 Depth10 Mw7.9

Time	Lat	Lon	Dep	Mag	DistLZH	SChtMLZH
04/01/2008 20:48	35.56	95.32	10	3.3	13.71	4.41277714E+02
05/01/2008 13:45	33.89	102.1	35	3.9	13.64	3.41744917E+03
08/01/2008 20:51	51.36	98.14	26	4	7.17	1.63210222E+04
08/01/2008 21:09	51.4	97.96	45	3.8	7.28	7.58330800E+03
10/01/2008 15:26	51.31	98.22	16	3.9	7.09	1.20985594E+04
11/01/2008 16:47	54.68	108.5	10	3.1	10.10	3.97458561E+02
12/01/2008 13:27	37.65	96.11	35	3.4	11.34	8.60941136E+02
13/01/2008 14:08	39.66	97.17	10	4.1	8.96	1.57702695E+04
16/01/2008 22:25	42.75	104.6	50	3.6	3.77	1.14933613E+04
17/01/2008 06:25	43.71	84.3	12	4.8	15.58	6.11770782E+04
17/01/2008 07:18	43.78	84.27	10	4.5	15.58	2.17578393E+04
17/01/2008 23:07	38.12	100.2	42	4.8	9.35	1.53368031E+05
19/01/2008 07:32	51.38	98.05	10	4.8	7.22	2.65688512E+05
20/01/2008 11:17	37.98	95.45	8	4.5	11.35	4.01588034E+04
20/01/2008 13:45	37.96	95.44	10	3.9	11.38	5.01887014E+03
29/01/2008 20:02	49.75	83.54	29	5	15.62	1.18847813E+05
30/01/2008 23:48	31.96	94.97	49	4.6	17.46	2.35809065E+04
31/01/2008 21:06	28.35	105	48	4.8	19.75	3.72324992E+04
04/02/2008 03:54	31.86	94.69	35	3.8	17.67	1.47677009E+03
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05/02/2008 11:49	51.33	98.13	10	3.9	7.15	1.21116018E+04
06/02/2008 00:40	38.86	110.6	10	3.7	9.79	3.35309760E+03
10/02/2008 21:02	32.05	95.12	35	4.7	17.32	3.43809370E+04

12/02/2008 14:02	55.92	110.9	10	4.1	12.00	9.04494736E+03
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13/02/2008 21:23	31.59	94.69	10	3.8	17.95	1.47265670E+03
13/02/2008 22:49	28.4	105	35	3.8	19.70	1.19874392E+03
14/02/2008 22:00	56.46	119.1	10	4.3	15.65	1.08009274E+04
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26/02/2008 17:50	30.08	101.8	24	4.9	17.89	6.52020924E+04
26/02/2008 22:39	38.49	99.41	10	3.8	9.19	5.33336041E+03
28/02/2008 15:19	31.3	104.1	10	4.5	16.45	1.95768329E+04
01/03/2008 05:11	33.79	96.4	35	3.6	15.06	1.00471507E+03
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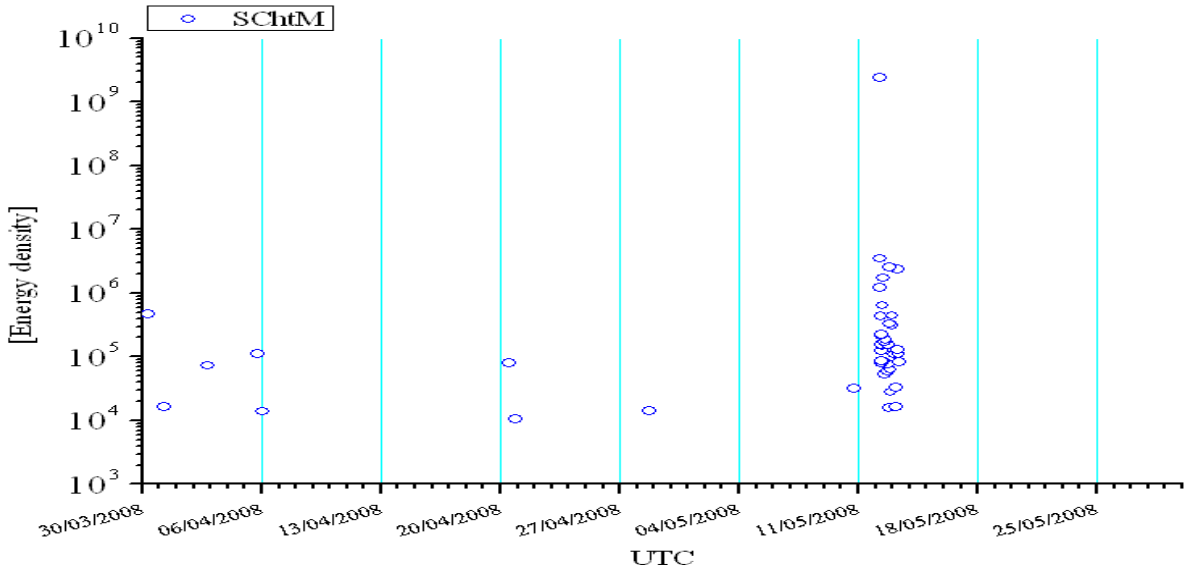

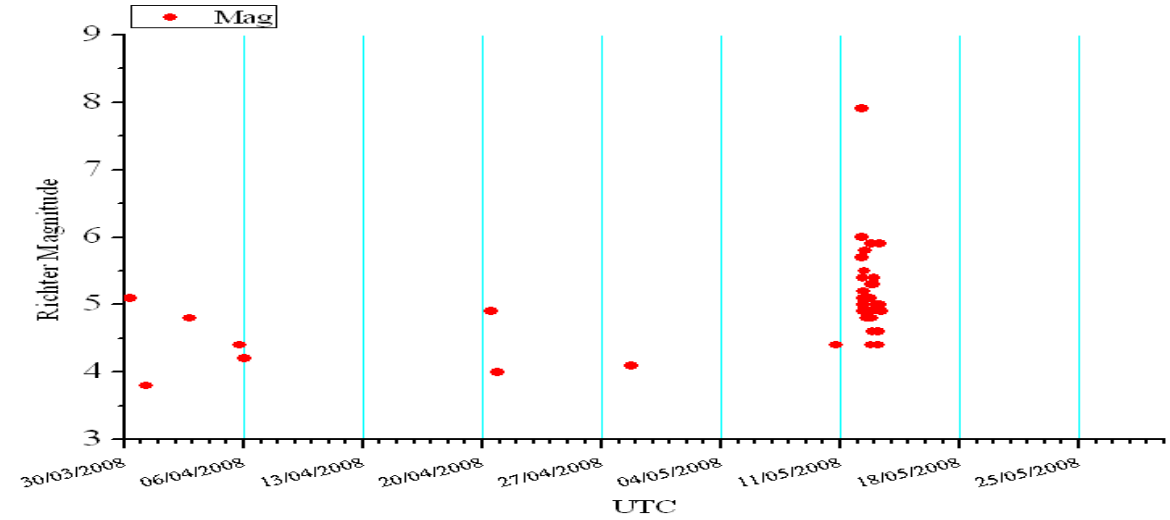
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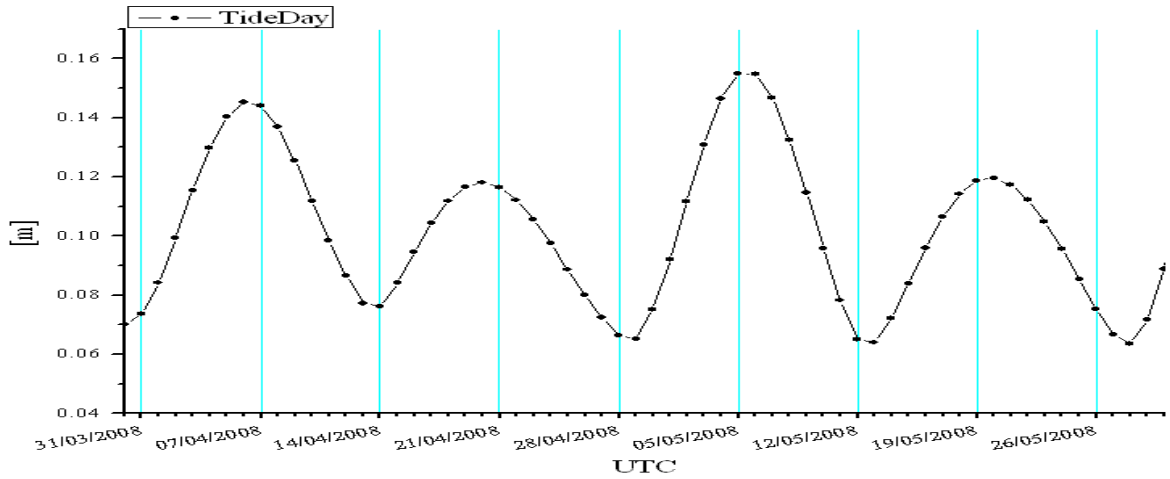
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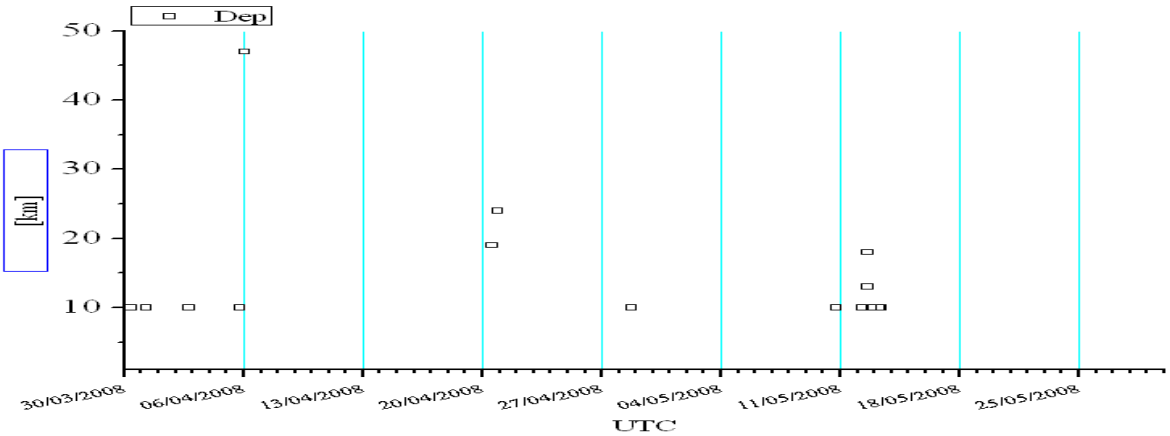
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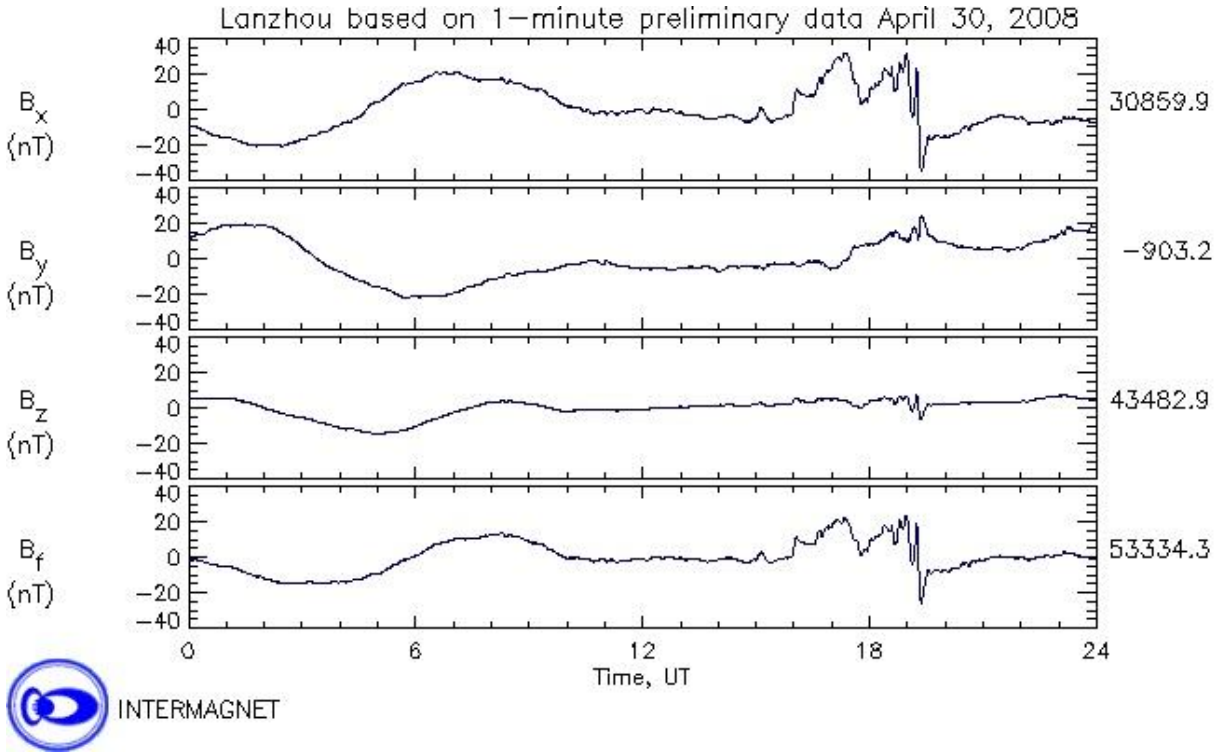
Lanzhou based on 1-minute preliminary data April 30, 2008
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B_y (nT)
B_z (nT)
B_f (nT)
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-903.2
43482.9
53334.3
40
20
0
-20
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0
6
12
18
24
Time, UT
INTERMAGNET