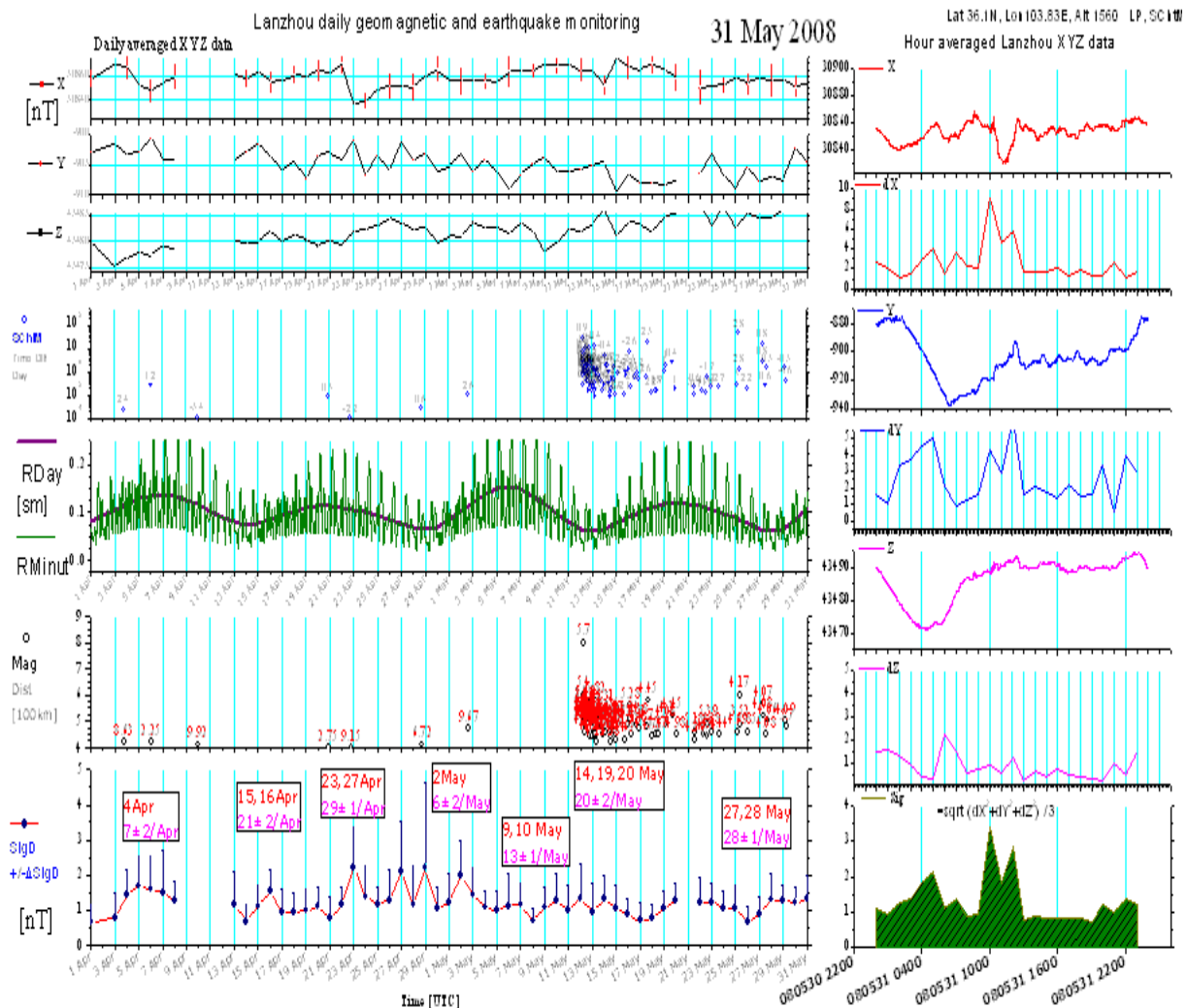


The time of China, Sichuan, Wenchun magnitude 7.9 earthquake could be predicted

China, Sichuan, Wenchun earthquake of 12 May 2008

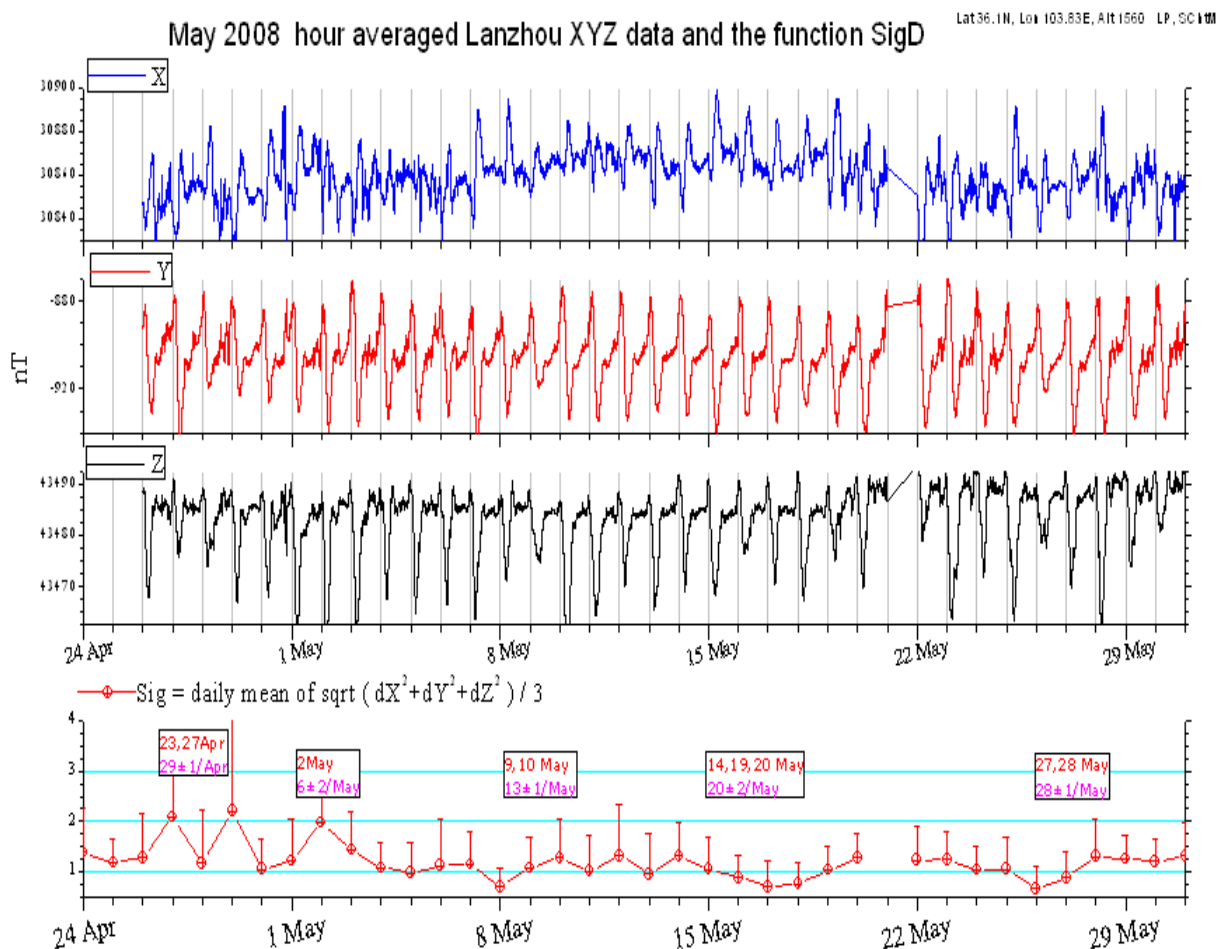
An earthquake of magnitude 7.9 on the Richter scale occurred on 12 May 2008 which was felt by millions of people from number of countries and took the lives of about 60 000 people and made millions of people homeless. This earthquake damaged buildings, roads and small and large infrastructure; further this earthquake created large landslides and flooding of the rivers in the epicentral region.

As one can see from the next figure the time period of this earthquake could be predicted from the Intermagnet Lanzhou (LZH) geomagnetic observatory one minute data follow our geomagnetic quake approach 3-4 days before with accuracy 1 day.



The earthquake precursor (*geomagnetic quake*) is $SigD$ 10% jump. The approximate time window for incoming event is defined from the next Earth Tide extremum (Dennis Milbert source code): in minimum ± 1 day and in maximum ± 2 days. EQ data from <http://www.neic.cr.usgs.gov/neis/bulletin/>. Reliability time control <http://www.emsc-csem.org/>. $S_{sigD} > 2\sigma$ [energy/distance], $Mag > 3$, distance < 800 km. The index of SC hM is the time difference between local Tide extremum and Eq time

The next figure is Month archive for the Lanzhou region:



In the next table are presented the NEIQ earthquake data, LZH data, Tide data, Local time of earthquake, time difference between earthquake time and tide extremum time, distance and energy density in the measurement point:

Time	Lat	Lon	Dep	Mag	Local Time	Tide Min Max	Day Diff	Dist	SChtM
04/03/2008 20:40	35.81	103.7	10	4	2	1	3.4	0.33	1.440E6
06/03/2008 19:13	36.76	96.58	38	4.2	1	1	0.7	6.5	3.770E4
11/03/2008 16:58	37.21	106.41	23	4.2	23	1	-4.2	2.63	1.870E5
21/03/2008 02:24	31.92	95.09	10	4.2	8	1	0.5	9.27	2.090E4
21/03/2008 05:28	32.18	95.03	39	4	11	1	0.4	9.17	1.010E4
23/03/2008 14:12	38.75	99.33	53	4.1	20	1	-2	4.92	4.120E4
24/03/2008 15:24	32.53	110.19	10	4.3	22	1	-3.1	7.08	4.900E4
27/03/2008 12:47	32.57	110.31	10	4.8	19	0	2.8	7.15	2.710E5
30/03/2008 08:32	37.84	101.84	10	5.1	14	0	0	2.6	4.640E6
03/04/2008 18:25	28.41	102.54	10	4.2	0	1	2.4	8.63	2.400E4
06/04/2008 01:05	36.2	106.31	10	4.2	8	1	1.2	2.25	2.630E5
09/04/2008 22:55	27.21	102.79	89	4.1	4	1	-3.4	9.92	1.120E4
20/04/2008 21:42	38.01	101.83	24	4	3	1	0.3	2.75	8.710E4
22/04/2008 19:16	32.02	95.17	10	4	1	1	-2.2	9.15	1.070E4

28/04/2008 17:49	39.06	110.46	10	4.1	0	0	0.6	6.72	2.710E4
02/05/2008 15:56	27.54	101.93	35	4.7	21	1	2.6	9.67	1.030E5
12/05/2008 06:28	30.99	103.32	19	8	12	0	0.9	5.7	2.530E10
12/05/2008 06:43	31.24	103.77	10	6	12	0	0.9	5.4	2.870E7
12/05/2008 06:54	31.13	103.8	10	5.6	12	0	0.9	5.52	6.930E6
12/05/2008 07:01	31.66	104.25	10	5.3	13	0	0.9	4.95	3.000E6
12/05/2008 07:22	32.35	105.33	10	4.9	14	0	0.9	4.4	9.330E5
12/05/2008 07:31	30.99	103.7	10	4.7	13	0	0.9	5.68	2.940E5
12/05/2008 07:34	31.3	103.69	10	5.4	13	0	0.9	5.33	3.700E6
12/05/2008 08:03	31.83	104.37	10	4.6	14	0	0.9	4.77	2.860E5
12/05/2008 08:10	31.24	103.55	10	5.2	14	0	0.8	5.41	1.810E6
12/05/2008 08:21	31.52	104.1	10	5.2	14	0	0.8	5.1	2.010E6
12/05/2008 08:26	31.39	103.96	10	4.9	14	0	0.8	5.24	6.800E5
12/05/2008 08:47	32.22	105.03	10	5	15	0	0.8	4.46	1.290E6
12/05/2008 09:07	31.22	103.7	10	5.1	15	0	0.8	5.42	1.270E6
12/05/2008 09:23	32.17	104.91	10	4.9	15	0	0.8	4.48	9.010E5
12/05/2008 09:42	31.53	104.11	10	5.5	15	0	0.8	5.09	5.700E6
12/05/2008 10:23	30.97	103.38	10	5.1	16	0	0.7	5.71	1.160E6
12/05/2008 11:11	31.2	103.61	10	5.7	17	0	0.7	5.45	1.000E7
12/05/2008 12:15	31.88	104.61	10	4.9	18	0	0.7	4.75	8.130E5
12/05/2008 13:40	31.04	103.52	10	4.8	19	0	0.6	5.63	4.220E5
12/05/2008 14:15	32.14	104.61	13	5.1	20	0	0.6	4.46	1.790E6
12/05/2008 14:46	32.73	105.61	10	5.1	21	0	0.6	4.1	2.110E6
12/05/2008 15:05	31.26	103.7	18	5.1	21	0	0.5	5.38	1.260E6
12/05/2008 15:28	31.06	103.51	10	5.1	21	0	0.5	5.61	1.200E6
12/05/2008 17:03	31.14	103.58	10	4.9	23	0	0.5	5.52	6.190E5
12/05/2008 17:52	31.89	104.45	10	4.7	23	0	0.4	4.72	4.120E5
12/05/2008 17:54	31.25	103.49	10	5.1	23	0	0.4	5.4	1.280E6
12/05/2008 18:55	32.22	104.85	10	4.4	0	0	0.4	4.42	1.650E5
12/05/2008 20:08	31.42	103.9	10	5.7	2	0	0.4	5.2	1.090E7
12/05/2008 20:45	31.75	104.42	10	5.4	2	0	0.3	4.87	4.370E6
12/05/2008 20:51	32.31	104.96	10	4.9	2	0	0.3	4.34	9.540E5
12/05/2008 21:08	31.53	103.44	10	4.6	3	0	0.3	5.09	2.540E5
12/05/2008 23:46	31.29	103.54	10	5.3	5	0	0.2	5.35	2.600E6
12/05/2008 23:54	31.31	103.54	10	5.2	5	0	0.2	5.33	1.860E6
13/05/2008 00:22	31.38	104.07	10	4.7	6	0	0.7	5.25	3.390E5
13/05/2008 00:54	32.16	105.06	10	4.4	7	0	0.7	4.53	1.570E5
13/05/2008 02:15	31.64	104.22	10	4.6	8	0	0.6	4.97	2.650E5
13/05/2008 03:00	31.22	103.68	10	5.1	9	0	0.6	5.42	1.270E6
13/05/2008 05:25	32.6	105.22	10	4.4	12	0	0.5	4.1	1.880E5
13/05/2008 05:36	32.6	105.49	10	4.6	12	0	0.5	4.19	3.620E5
13/05/2008 06:38	31.32	103.78	10	4.5	12	0	0.4	5.31	1.660E5
13/05/2008 07:07	30.89	103.16	9	5.8	13	0	0.4	5.82	1.260E7
13/05/2008 07:19	32.44	105.32	10	5	14	0	0.4	4.3	1.370E6
13/05/2008 07:53	32.28	105.05	10	5	14	0	0.4	4.4	1.320E6
13/05/2008 08:11	32.58	105.17	10	4.2	15	0	0.3	4.11	9.390E4
13/05/2008 08:20	31.4	103.99	10	5	14	0	0.3	5.23	9.650E5
13/05/2008 10:16	31.74	104.44	10	4.9	16	0	0.3	4.88	7.730E5
13/05/2008 12:51	32.21	105.31	10	5	19	0	0.1	4.54	1.240E6
13/05/2008 13:31	32.33	105.17	10	4.8	20	0	0.1	4.37	6.670E5

13/05/2008 16:23	31.75	104.42	10	4.8	22	0	0	4.87	5.500E5
13/05/2008 19:51	30.99	103.42	10	4.8	1	0	-0.1	5.69	4.140E5
13/05/2008 22:03	31.31	103.85	10	4.5	4	0	-0.2	5.32	1.660E5
14/05/2008 01:56	31.64	104.06	10	4.6	7	0	-0.4	4.96	2.660E5
14/05/2008 02:54	31.33	103.5	10	5.5	8	0	-0.4	5.31	5.270E6
14/05/2008 05:54	32.06	104.01	10	5.1	11	0	-0.6	4.49	1.790E6
14/05/2008 09:26	31.37	104.04	10	5.2	15	0	-0.7	5.26	1.900E6
14/05/2008 10:00	32.44	105.13	10	4.9	17	0	-0.7	4.25	9.940E5
14/05/2008 10:44	32.1	104.95	10	4.6	16	0	-0.8	4.57	3.090E5
14/05/2008 12:27	31.76	104.16	10	4.4	18	0	-0.9	4.83	1.400E5
14/05/2008 13:29	32.33	105.18	17	4.2	20	0	-0.9	4.38	8.150E4
14/05/2008 17:17	31.47	103.96	10	4.5	23	0	-1	5.15	1.760E5
14/05/2008 17:33	31.27	103.7	10	4.8	23	0	-1	5.37	4.600E5
14/05/2008 21:01	31.64	104.19	10	5.1	3	0	-1.2	4.97	1.490E6
14/05/2008 22:10	31.28	103.72	10	4.8	4	0	-1.2	5.36	4.620E5
15/05/2008 00:09	31.87	104.5	10	4.3	6	0	-1.3	4.74	1.020E5
15/05/2008 05:27	31.99	104.44	10	4.9	11	0	-1.5	4.6	8.590E5
15/05/2008 18:05	31.94	104.32	10	4.3	0	0	-2.1	4.65	1.060E5
15/05/2008 21:55	32.32	104.75	10	4.9	3	0	-2.2	4.29	9.760E5
15/05/2008 22:10	31.33	104.03	10	4.9	4	0	-2.2	5.3	6.640E5
16/05/2008 03:34	31.39	104.05	10	5.1	9	0	-2.5	5.24	1.360E6
16/05/2008 05:25	31.36	103.37	3	5.6	11	0	-2.6	5.28	7.700E6
16/05/2008 06:34	32.48	105.25	10	4.5	13	0	-2.6	4.24	2.510E5
16/05/2008 16:14	31.13	103.61	10	4.9	22	0	-3	5.53	6.170E5
16/05/2008 20:16	31.26	103.71	10	5	2	0	-3.2	5.38	9.150E5
16/05/2008 22:33	32.28	105.19	10	4.7	5	0	-3.3	4.43	4.610E5
17/05/2008 13:32	31.92	104.6	10	4.8	19	1	2.6	4.7	5.850E5
17/05/2008 17:08	32.21	104.97	9	5.8	23	1	2.5	4.45	2.050E7
18/05/2008 00:45	31.83	104.01	10	4.4	6	1	2.2	4.75	1.450E5
18/05/2008 09:25	31.36	103.69	10	4.5	15	1	1.8	5.27	1.690E5
18/05/2008 12:37	31.21	103.15	10	4.5	18	1	1.7	5.47	1.580E5
19/05/2008 04:08	32.58	105.08	10	4.9	11	1	1	4.08	1.070E6
19/05/2008 06:06	32.43	105.3	10	5.1	13	1	1	4.3	1.940E6
19/05/2008 17:52	32.23	105.04	10	5.2	0	1	0.4	4.45	2.580E6
20/05/2008 00:57	31.63	104.14	10	4.5	6	1	1	4.98	1.870E5
21/05/2008 13:59	31.44	103.92	39	4.6	19	1	-0.6	5.18	2.230E5
21/05/2008 15:29	32.29	104.93	23	4.3	21	1	-0.7	4.36	1.130E5
22/05/2008 07:18	31.2	103.87	10	4.5	13	1	-1.3	5.45	1.590E5
22/05/2008 15:00	31.88	104.57	35	4.4	21	1	-1.6	4.74	1.320E5
22/05/2008 17:37	31.25	103.66	10	4.9	23	1	-1.7	5.39	6.450E5
23/05/2008 00:05	31.26	103.94	10	4.6	6	1	-2	5.38	2.300E5
23/05/2008 16:10	32.25	105.1	10	4.5	23	1	-2.7	4.44	2.300E5
25/05/2008 04:27	31.92	104.5	10	4.6	10	0	3	4.69	2.950E5
25/05/2008 08:21	32.59	105.42	10	6	15	0	2.8	4.17	4.580E7
25/05/2008 09:34	33.08	104.96	10	4.9	15	0	2.8	3.52	1.390E6
26/05/2008 00:39	30.85	103.34	10	4.6	6	0	2.2	5.85	1.970E5
27/05/2008 08:03	32.73	105.56	10	5.2	15	0	0.8	4.08	3.010E6
27/05/2008 08:37	32.74	105.56	10	5.7	15	0	0.8	4.07	1.700E7
27/05/2008 13:59	32.62	105.21	21	4.5	20	0	0.6	4.08	2.560E5
27/05/2008 17:35	32.71	105.44	10	5	0	0	0.5	4.06	1.520E6

29/05/2008 04:48	32.69	105.49	10	5	11	0	-0.5	4.09	1.500E6
29/05/2008 07:10	30.98	103.5	10	4.8	13	0	-0.6	5.7	4.130E5

For starting the solution for epicenter prediction problem we need the Monitoring set of 3 stationary and one mobile device for Geomagnetic vector data with 10- 50 samples per second and accuracy less then 1 nT and Earth currents 2 dimension vector with same samples and relative accuracy less then 5% as well as the vector all wave radio receiver data with logarithmic frequency scale.

We hope that the depth, magnitude and intensity problem can be solved in the framework of proposed Complex interdisciplinary program.

In the next is our proposal to China earthquake administration from 2004.

Abstract Project- preliminary

The Geomagnetic Quakes as Reliable Earthquake Precursor- Beijing, Lanzhou regions, 2003

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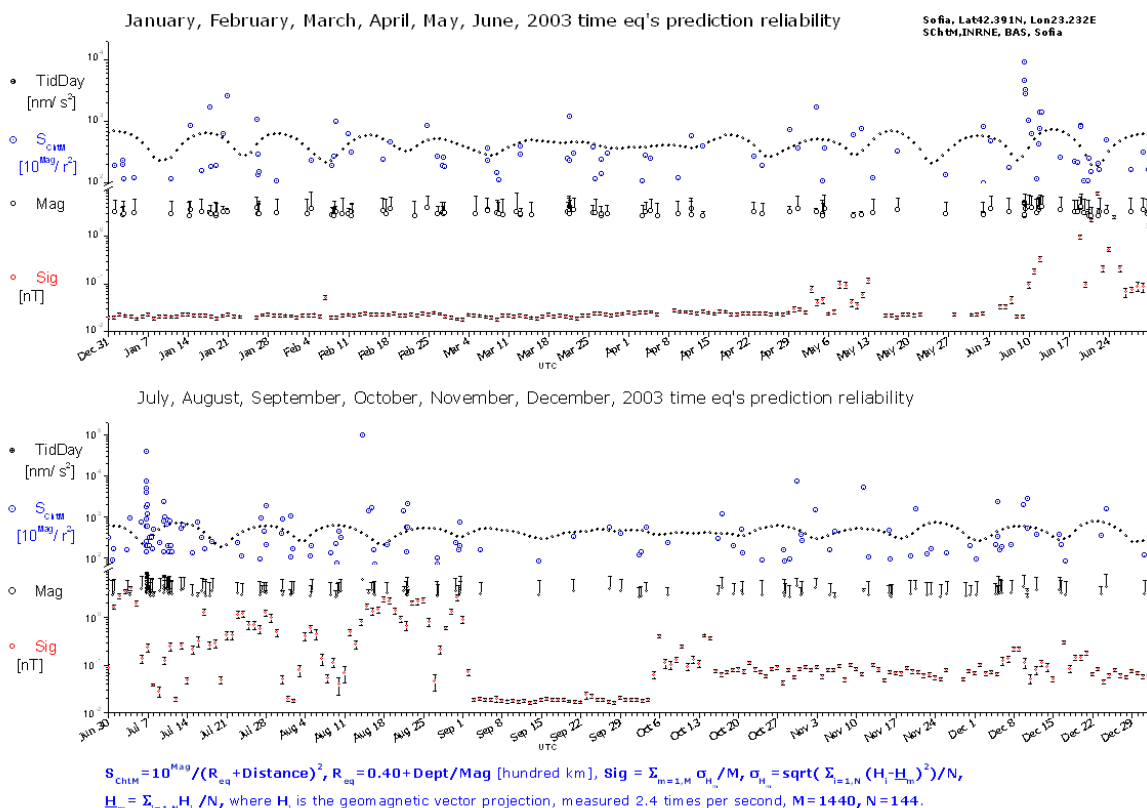
China geophysicists, seismic earthquake data

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

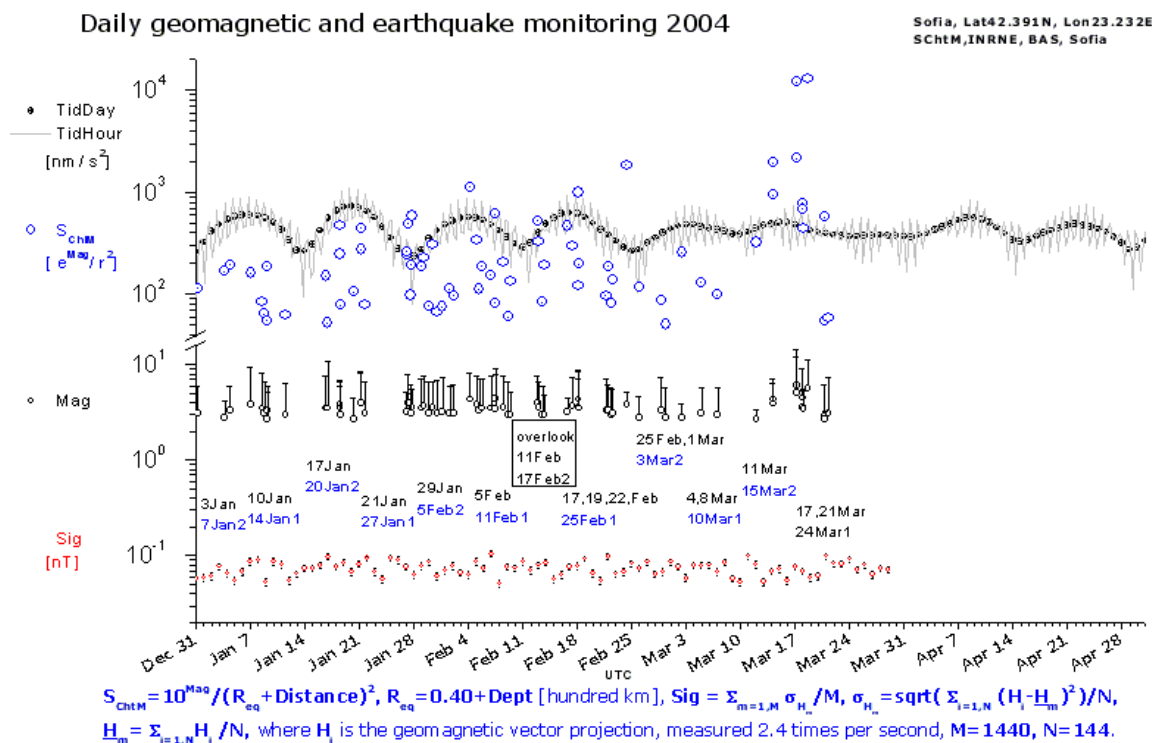
The impressive development of the Earth sciences on the basis of new precise Crust condition parameters measurements permits to estimates the probabilities for earthquakes risk. But the prediction the time, epicentre and Magnitude of incoming earthquake is not a solved problem. Many scientists are state 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

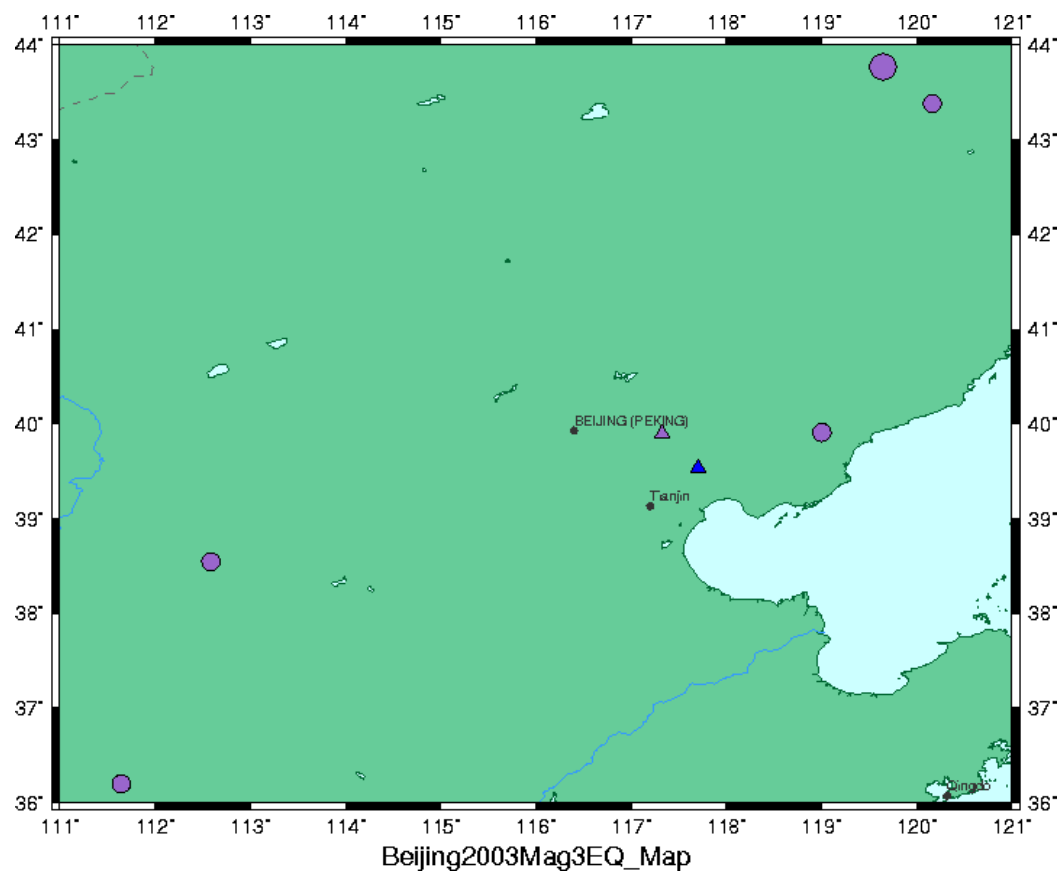


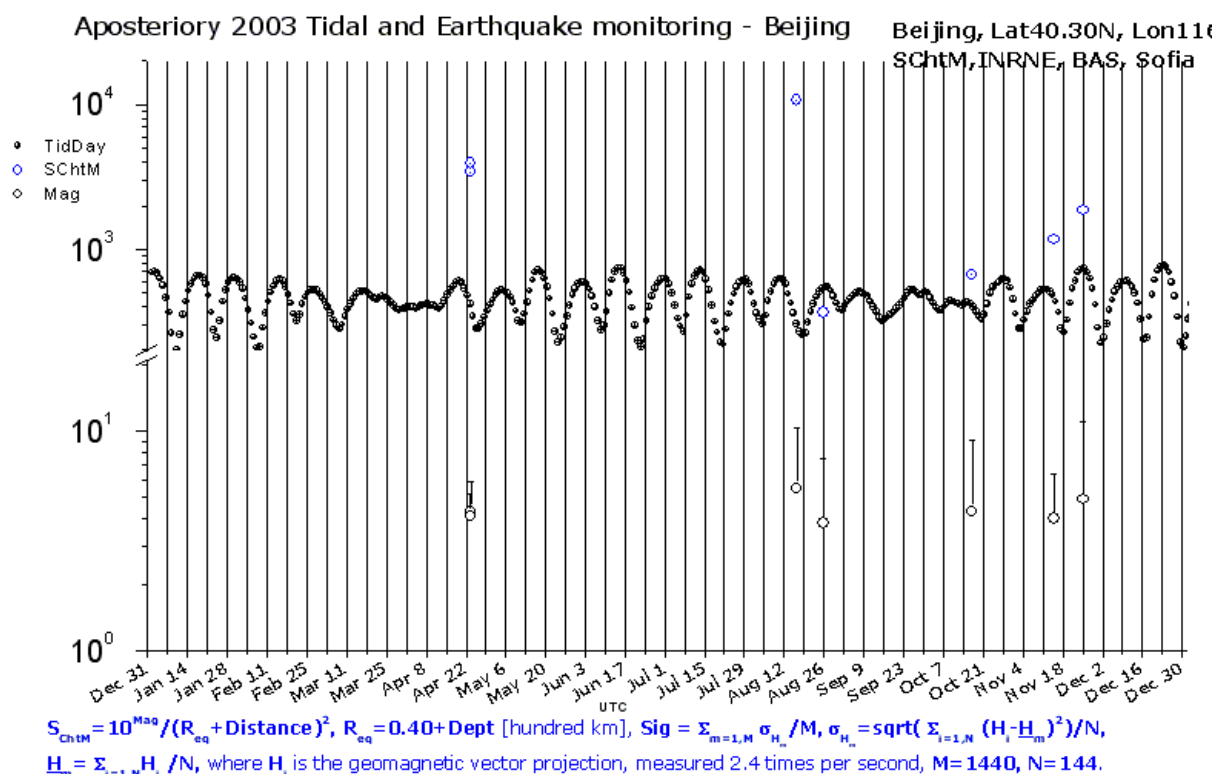
The earthquake precursor (geomagnetic quake) is Sig "irregularity". The vertical error of Mag is distance [Hundred km]. The approximate time window for incoming event is defined from the next Tidal potential (Venedikov et al model) minimum (+/-1day) or maximum (+/-2). EQ data from <http://www.neic.cr.usgs.gov/neis/bulletin/> and GPHI,BAS,Sofia. Reliability time control <http://www.emsc-csem.org/>.
Figure 20. The reliability of earthquake time prediction, Sofia region, 2003



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://www.neic.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.

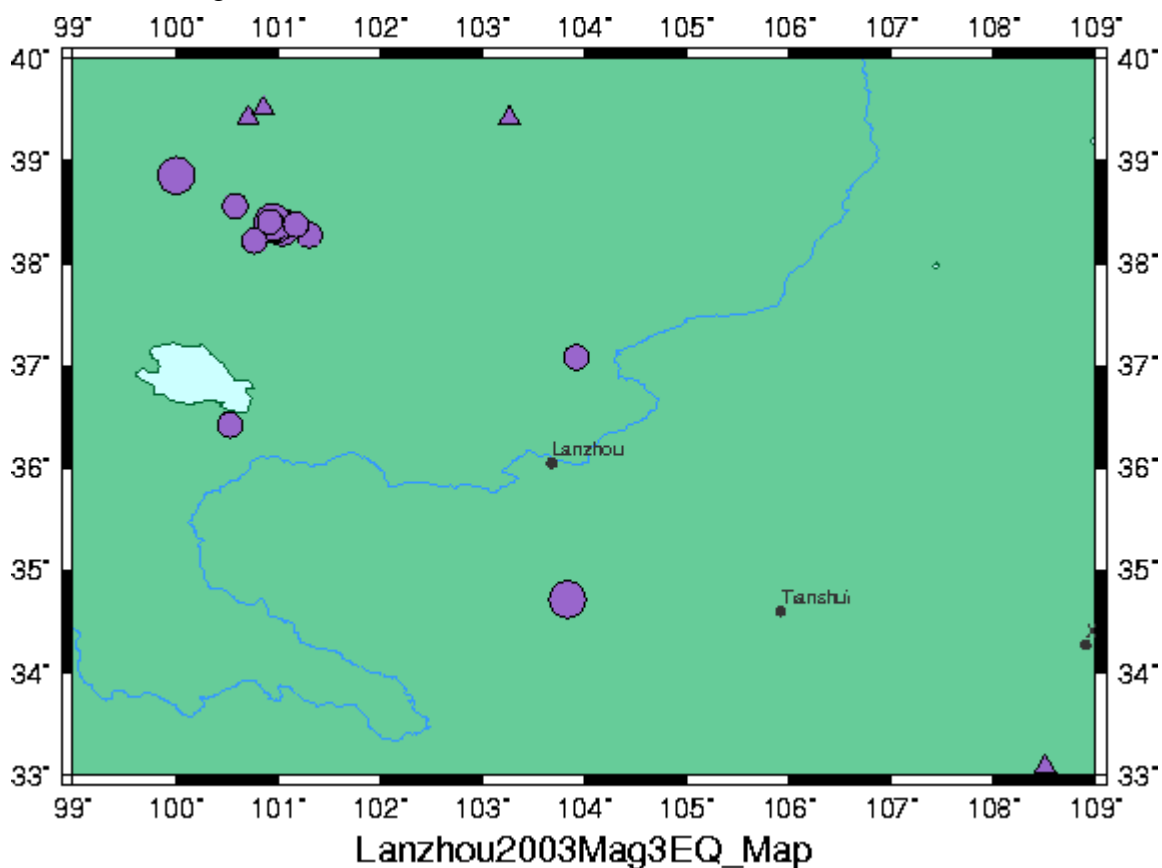
2.2. Beijing region

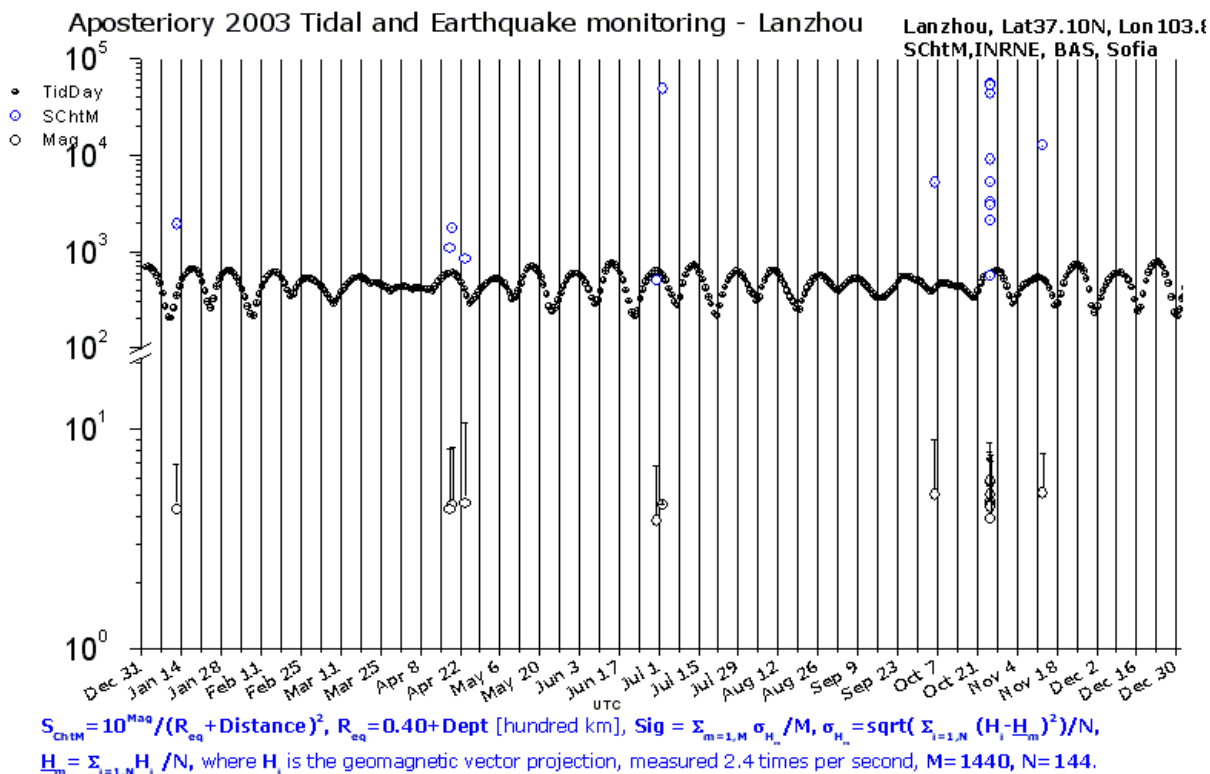




The earthquake precursor (geomagnetic quake) is Sig "irregularity". The vertical error of Mag is distance [Hundred km]. The approximate time window for incoming event is defined from the next Tidal potential (Venedikov et al model) minimum (+/-1day) or maximum (+/-2). EQ data from <http://wwwneic.cr.usgs.gov/neis/bulletin/>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

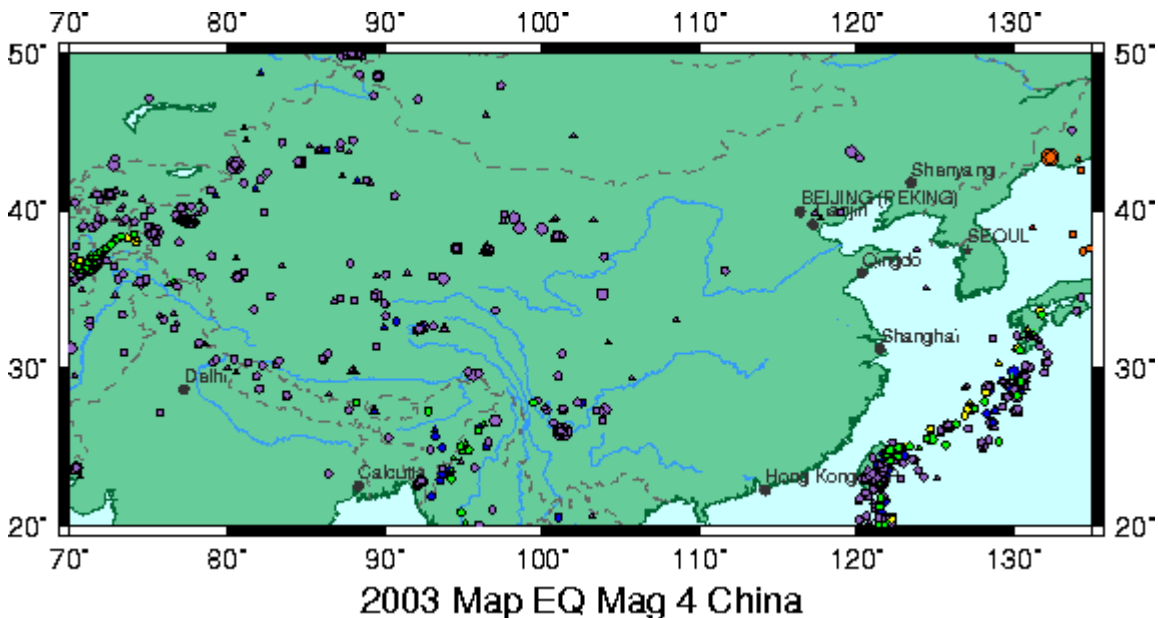
2.3. Lanzhou region





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.

3. Proposal for earthquake research and prediction NETWORK



4. Conclusion

References