



Chinese Mobile Geomagnetic Monitoring Array

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From 2010, we have set up Chinese Mobile Geomagnetic Monitoring Array (CMGMA) gradually for seismic monitoring and forecasting. Today, the array includes 973 geomagnetic repeat survey stations, the mean intervals between adjacent 2 stations is about 70km in east of China and 150km in west, covers 7'680'000km² monitoring area.

We measure total intensity (F), declination (D) and intensity (I) on each station one time every year, and then remove diurnal variation using minutely averages data on the nearest observatory and remove main field using "Chinese Geomagnetic Reference Field (CGRF) –Spherical Cap Harmonic model". After removing secular variation using a natural orthogonal component (NOC) model base hourly averages data from 1995 to now on 31 observatories in China, we calculate the variations of lithosphere magnetic field between each adjacent two years. After analyse the variations of lithosphere magnetic field before all 25 earthquakes with magnitude bigger than 5 in our monitoring area, 2 kinds of anomalies were found during 1-18 months before 20 earthquakes of 25 samples. The first kind was typical called "Quiet Island", and the variant kind called "frozen area" or "quiet byland".

The main character of these 2 kind anomalies is the variations of lithosphere magnetic field are smaller near the epicenter than surrounding. When we draw the horizontal variations (ΔB_y , ΔB_x) as an arrow at level, the variations are identical, scale and direction, in a wide range, as a liquid river flowing from one side to the other. However, the variations near the further epicenter show their difference, with low value and different direction. Even we have picked these anomalies out before the earthquakes in each July, just soon after our field survey. We are not clear why these anomalies are there, and can not further propose a perfect idea about magnitude and original times.