STUDY ON APPLICATION OF THE LOW-FREQUENCY ELECTROMAGNETIC SIGNALS IN EARTHQUAKE PREDICTION

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One week before the Wenchuan Ms8.0 earthquake in Sichuan Province, the ionospheric anomalies was captured by DEMETER satellite, and an abnormal electromagnetic radiation also appeared in ELF band electromagnetic field data. Before and after the main shock and a series of aftershocks, the corresponding anomaly information was captured in ELF electromagnetic observation data. We use spectrum method to inspect the ELF electric field, magnetic field data in frequency band of 0.5Hz ~ 39Hz, which is sampled at Longnan seismic station during January 2008 and January 2009. The auto power spectrum of electricity and magnetic field shows sudden jump significantly before Wenchuan earthquake and the aftershocks. The abnormal magnitude is related to the earthquake magnitude and the epicenter distance etc. The electromagnetic anomalies during shocks is bigger than normal month 1~ 5 orders of magnitude. A coseismic electromagnetic phenomenon was found in Ms6.1 strong aftershocks of August 1, and 5, 2008 in the Longnan ELF observation. We compared the ELF data to the earthquake data and found that the magnetic field component and the seismic waves arrive simultaneously, but the reaction of electric field component is not obviously. We have predicted two strong aftershocks successfully using the above conclusions.

WenChuan earthquake; Low-frequency EM anomalies; Short-term earthquake prediction

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