

## 1.2 IDENTIFYING AND LOCALIZING OF SEISMOGENIC EM ANOMALIES FROM DATA OBSERVED BY PERMANENT MT STATIONS

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### ABSTRACT

The observed data from permanent magnetotelluric (MT) stations in the Southern segment of South-north Earthquake Belt of China have indicated potential seismogenic-induced electromagnetic disturbances. To simulate the seismogenic electromagnetic (SEM) anomaly, we combined the MT responses with responses from an arbitrarily oriented electric dipole underground. Synthetic results have shown that seismogenic EM radiation can produce recognizable apparent resistivity and phase anomaly in MT data for station, even far from the seismogenic zone. Long-term MT data obtained from Dali and Lijiang stations in Yunnan Province, China, were processed base on daily variation. We extracted the background (quietperiod) responses of these stations and identified two sections of data with SEM anomalies serving as precursors of two earthquake events (Yunlong & Yangbi). Selecting certain anomalous responses according to experimental criteria, we used them for inversion to determine the parameters of dipole location, including depth and orientation, and the spectrum of moment. The distribution of predicted dipoles are mostly located in or near the seismogenic area, and their azimuth generally exhibits good directivity toward the seismogenic fault, indicating the feasibility of this method in predicting the seismogenic zone. By analyzing the spatial distribution and time-varying characteristics of the inversion results of SEM anomalies in MT data, in conjunction with the geological and electrical structural characteristics of the predicted area and a comprehensive evaluation of seismic activity, it is expected to achieve imminent earthquake prediction.

**KEY WORDS** : Seismogenic EM anomaly, MT responses, dipole responses, identifying SEM, positioning SEM by inversion

### INTRODUCTION