Evaluation of the 2017 *M* 6.6 Jinghe earthquake epicenter based on the Parkinson vector

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Relationships between observation data at geomagnetic stations and earthquakes have been widely reported when the space environment, instrument failure, and other factors are excluded. In this work, The Parkinson vectors derived from 3-component geomagnetic data at 4 stations were obtained via the magnetic transfer function and discussed with respect to the location (82.89°E, 44.27°N) and the depth (16 km) of the M 6.6 earthquake on August 9, 2017 in Xinjiang. To mitigate artificial disturbances, low noise data during the 23:00 –5:00 LT are utilized. We compute the background distribution and monitoring distribution using the azimuth of the Parkinson vectors at 0.005 -0.01 Hz at each station within an entire study period of 2017 and a 15-day moving window to determine the anomalous azimuths of high-conductivity materials. The analytical results show that the epicenter is located in high conductor anomaly 15 days before the earthquake. The anomaly becomes unclear about 6 days before and remains insignificant after the earthquake. The similar results can also be observed in Taiwan. The agreement of conductivity changes before earthquakes in different region sheds lights on forecasting locations of forthcoming earthquakes via changes of underlying electrical conductivity during earthquakes. This manuscript makes a preliminary discussion on the earthquake event, and more earthquake cases are needed to determine the efficiency of detection of seismo-electromagnetic anomalies using the Parkinson vector.

Keywords: The Jinghe M6.6 earthquake, Seismo-electromagnetic anomalies, Parkinson vectors