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How efficient is DigiMine technology in recording earth movements? A look at the Botswanan earthquake

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ABSTRACT

It is crucial to record ground movement of any magnitude to enable the safe and economical design of excavations and infrastructure. The DigiMine Laboratory is equipped with technologies to record such movements. This paper analyses the effectiveness of the Digital Mine instrumentation in recording earth movements in light of the Botswanan earthquake which occurred on the 3rd of April 2017 at 17:40 UTC. Recordings from the Digital Mine are compared with other ground sensing technologies which also captured the event (USGS and GEOFON systems). USGS and GEOFON systems recordings suggest that there are a number of possible mechanisms that could have resulted in the earthquake as discussed in the paper. Compared to the USGS and GEOFON systems, DigiMine system could not provide a self-analysis system that could give possible source mechanisms. However, the system's success in recording the event is an indication that the system works. For a comprehensive analysis, more data from various sensors needs to be collected. For example, by connecting to the national seismic monitoring system or to the local mines seismic monitoring system. Such connections will enable the development of a better self-analysis from the system and possibly prediction of future events. More importantly it will contribute to better understanding of regional seismicity and its potential impact on excavation design.