



## **Seismic imaging with Distributed Acoustic Sensing in an active room-and-pillar mine**

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To study the feasibility of distributed acoustic sensing (DAS) technology for monitoring in active mines, a field trial was conducted in July 2017 at the Lafarge-Conco limestone mine in N. Aurora Illinois, USA. Pillars are about 20 by 20 by 20 meters whereas the excavated room is also about 20 m wide and 20 m high. The DAS cable was deployed in the floor of the first level in an L-shaped loop that was about 300 meters long. Three co-located loops were installed in a groove that was cut with a pavement saw. The bottom loop was cemented at a depth of about 5-cm. The middle loop was covered with fines and the top loop was laid on top of the fines. The DAS recorded signals from two daily mine blasts on July 27 and 28. In addition, a 23-kg weight-drop source that occupied several locations co-located with the fiber-optic cable was also recorded by the DAS system. With the first arrivals of the blast signal and surface wave arrivals of weight-drop signals, the local seismic velocities were imaged with seismic tomography. The field test showed that DAS can be used to monitor ground motion within an active mine and could be used for seismic imaging.

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