ID: Type: **Poster**

Determine the relationship between seismic and acoustic signals

There are hundreds of mines and quarries in the territory of Mongolia using blasts with varying yields and firing schemes. These mining-related explosions occupy a large part of the seismic catalogue issued by the IAG. To discriminate between the earthquakes and explosions is more difficult as the sizes and distances are different for all events. This study is designed to quantify the Baganuur mining explosions using seismic and infrasound station data. The study uses ground truth coal mining explosion data from 2016 which were obtained from the Baganuur mine company. In total data from 167 explosions were used for this analysis. Using infrasound station data, we estimated a minimum explosive level that can be detected at infrasound stations. We also included a seasonal variation in the detectable levels of explosive. For seismic acoustic data, we estimated a relationship between the mining explosions total explosive yields with peak amplitude, magnitude and Arias intensity. A waveform cross correlation technique was used in order to find the detection threshold level using a master event of the Baganuur mining area.

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Track Classification: Theme 2. Events and Nuclear Test Sites