

# INFRASOUND FROM SUITES OF MINING EXPLOSIONS AT LARGE DISTANCES –OBSERVATIONS AND MODELING

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As part of an effort to compile GT seismo-acoustic events with infrasound recorded at distances of 1,000 km or more, we analyzed infrasound recordings for three paths: from Powder River basin, Wyoming, to I10CA (Lac du Bonnet, Canada) and from Zeleznogorsk, Russia, to I26DE (Freyung, Germany) and to I31KZ (Aktyubinsk, Kazakhstan).

Here we present some of the results of this analysis. In all, 105 events in the Powder River basin between Jan 1, 2005 and May 31, 2006 and with local magnitudes  $M_L$  between 2.9-3.7, and 53 events at Zeleznogorsk between Jan 1, 2004 and May 1, 2006 with  $M_L$  between 3.0-3.8, were analyzed. Infrasound signals were detected for about half of the Powder River basin events and for about half of the Zeleznogorsk events. Signal detectability at the three stations was strongly seasonally dependent. Detections at I26DE and I31KZ, located in opposite azimuths from Zeleznogorsk, were unique to each station; during summer time there were detections at I26DE and no detections at I31KZ, with this situation reversed during the winter months. Events were generally not detected at I10CA during the summer. No obvious correlation between detectability and event magnitude, or between detectability and local noise level, could be established.

The observed arrival times of detected signals were in broad agreement with those predicted for eigen rays calculated using a standard HWM model (InfraMap/HARPA). Also, eigen rays calculated when no detections were observed had mostly very late arrivals, corresponding to late thermospheric phases. The residuals of observed azimuths for signals recorded at I10CA had a slow seasonal variation, in broad agreement with results calculated for the eigen rays. The azimuth from the Powder River basin mining area to I31KZ is about 41 degrees east of north. Seasonal changes in azimuth residuals were not observed for I26DE and I31KZ, which are located almost due west and due east, respectively, from the Zeleznogorsk mining area.