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Infrasonic and seismic signals from the Myanmar earthquake of November 11,2012

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On November 11, 2012, at 01:12:38 UTC (09:12:38 Beijing Time), a strong earthquake (Mw=6.8) occurred in Myanmar. The epicenter (23.0˚N,95.9˚E,focal depth ∼10 km) was near the town of Male, 52 km NNE of the city of Shwebo. The earthquake with a rupture length of 60-70 km resulted from right lateral movement on the Sagaing Fault related to collision between the Indo-Australian Plate and the Eurasian Plate.

At a distance of 366 km from the epicenter, infrasonic and seismic signals were recorded by Tengchong seismo-acoustic array located in southwest of China for monitoring volcanic and earthquake activity, which consists of four MB2005 microbarometers with bandwidth 0.01-27Hz and four BBVS-60 seismometers with bandwidth 0.01667-50Hz arranged in a centered triangle with an aperture of about 1.8 km. PMCC provided by CEA/DASE applied to analyze infrasound data. Comparison of the infrasonic and seismic signals produced by this earthquake showed infrasonic signals with different arrival times and azimuths may be classified as local, epicentral and diffracted or secondary sourced infrasound, but seismic signals only include P, S and surface waves can produce local infrasound through ground-coupled air waves at the station.

The PMCC results indicated that the infrasonic waves showed a consistent acoustic trace velocity of approximately 0.348 km/s from 09:30 to 09:36 (Beijing Time) and the azimuth of arrival changed with time from 227 to 217 degrees. There are mountain chains with altitude more than 1000 m in the east of the epicenter. Mountains shaking induced by earthquake acted as a speaker and radiated the infrasound that traveled to Tengchong seismo-acoustic array. It was worth noting that PMCC detected a group infrasound with trace velocity of approximately 0.339 km/s and arrival azimuth of 237 degree from 09:23:31 to 09:24 (Beijing Time). It may be inferred that the seismic surface wave induced by earthquake reach the mountains on the border between China Yunnan and Myanmar, then acted as a secondary sources and generated diffracted infrasound.

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