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The Infrasound signals produced by a bolide on 20th January, 2013

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The infrasound observation system has been installed in Isumi, Chiba-prefecture (approximately 60 km SE of Tokyo) as a component of the International Monitoring System for the CTBT's verification regime. It is an array observation site and is comprised of six elements with an aperture of about 2km. It had been deployed on November 2004. Some interesting infrasound signals are observed, which was generated by the volcanic explosions, large earthquakes, artificial explosions and so on.

A bolide was flying over Kanto region around 02:42 on 20th of January 2013 (JST). Optical observation data gave the information that the explosion area of this bolide was over Mt. Tsukuba. Distance between Mt. Tsukuba and Isumi is about 100km, back azimuth of Mt. Tsukuba is 350 degrees. The infrasound sensors detected some pulsed waves around 02:48. A back azimuth of signals was estimated 356 degrees from north. It is consistent with the area of its explosion. From observed apparent velocity of signals, the elevation angle of these signals was estimated 20 degrees. According to both this elevation angle and the distance, the altitude which the bolide explosion happened is estimated approximately 30km and travel time of atmospheric wave is calculated about 5 minutes. Arrival time of signals at Isumi is around 02:48, it is also consistent with evaluation results.

In this presentaion, some remarkable optical observation, seismic records and TEC are introduced and discussed.

Keywords: infrasound, bolide, explosion, perssure wave, microbarometer