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of fireworks to understand the nonlinear behavior of shock waves excited by explosions

As infrasound sensors have become more compact and highly accurate, the true picture of various phenomena is becoming clearer through precise and dense observation.

Considering such kind of background, we attempted to observe the infrasound signals generated by explosion events to understand the actual state of waveform deformation and attenuation due to propagation. We know that the infrasound signals of explosion events have been extremely researched in the past, but we would like to take another look at these signals. The target event was fireworks as part of theme park events. Taking advantage of the fact that such fireworks were regularly launched on every weekend of the holiday season, observations were made by deploying a portable pressure sensor near the launch site or several kilometers from the sound source. Although each observation was conducted at one or two locations, fireworks were held with the same programme every time, so we believe that we were able to obtain the almost same results as observing one event at multiple locations at the same time. Such observations made it possible to clearly see waveform deformation in the signal propagation process produced by the explosive event, especially the non-linear behavior of the shock wave.

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