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Evaluation of the Chemical Explosions Impact using Infrasond and InSAR Analysis

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Chemical explosions generate shockwaves which can be recorded at far distant with infrasond sensors. Infrasond propagation and energy of the explosion are main factors which control the infrasonic wave arrivals. In this study, a China explosion which happened on 22 March 2019, Biuret explosion on 4 August 2020, and the explosion of MOMO-2 rocket failure during the launching process will be investigated. The infrasond data sets of these explosions are extracted from IMS infrasond stations and KUT infrasond sensors which are distributed all over Japan.

The explosions had different propagation conditions which can be simulated using ray tracing and parabolic equation numerical methods, furthermore the transmission losses can be estimated in order to determine the yield energy in TNT-equivalent of each explosion, moreover the severe surface damages were identified by using InSAR techniques which can be classified according to the interferometric coherency.

In conclusion, the integration between the infrasond technique and InSAR showed the safety zone which should be taken in account for any chemical factories or rocket launch sites.