

Detection efficiency of the IMS for Bolides

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In this study we examined 344 bolides (airbursts) reported on the JPL CNEOS website (<https://cneos.jpl.nasa.gov/fireballs/>) between 2007-2018 and attempt to correlate these with infrasound detections. We found 206 of these bolides were detectable by at least one infrasound station while only 42 were automatically registered as part of the Reviewed Event Bulletin (REB) issued daily by CTBTO. However, this global REB detection rate of ~10% averaged from 2007-2018 is less than the “modern” rate (from 2014-2018) which approaches 20%. Above the 1 kT CTBTO design threshold, we find that 40% of airbursts are reported in the REB, while more than 90% are detectable at one or more infrasound stations. All airbursts with energy > 2 kT reported on the JPL fireball site since 2007 have been detected infrasonically. However, the REB is only complete above 15 kT with the automated detection system not having reported at least four airbursts with energies between 8 – 14 kT during 2007-2018. We will present details of the IMS airburst detection efficiency by season, airburst energy and other detection variables.

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