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and Experimental Analyses of Infrasound-Electromagnetic Data Fusion

Electromagnetic pulse has been excluded from the IMS technologies because its high false alarm rate due to lightning discharges. Here we examine a possible method of overcoming this obstacle by merging infrasound data with electromagnetic measurements. Theoretical estimations predict a detection rate of one lightning per second for a typical electromagnetic receiver which is capable of detecting nuclear explosion from a distance of 2500 km. However, it is shown that once an infrasound event is detected, the time window determined by the IS system location accuracy and the sector determined by the directional accuracy of the two crossed loop antennas leave us with only few lightning signals requiring further discrimination. An antenna was located adjacent to the Mt. Meron infrasound array, and the measured EM fields have been recorded for three days. Initiation time and location of selected infrasound events have been calculated. Then, the EM data was searched for possible signal arriving from respective time and location. We present here examples and statistical analysis of the results. These results give hope that the proposed data fusion method can implemented to enhance both detection and discrimination capabilities of the IMS.

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