

Data Fusion of Electromagnetic and Infrasound Measurements

Measurements of electromagnetic (EM) fields have been proposed as a means of supporting and aiding infrasound (IS) signal analysis. As opposed to nuclear explosion, other natural and man-made IS sources do not produce an EM signal. Thus, if an IS signal is not accompanied by an EM pulse, it is known that it is not originated from a nuclear test. Lightning discharges are the main source of EM pulses. Due to their high abundance, fortuitous coincidence of lightning with an IS signal are a common situation. These events may be mistakenly assumed as a nuclear test. To avoid this obstacle, a reliable method for lightning detection and identification is required. In this work we present results of continuous measurements of EM fields, adjacent to IAMR IS array at Mt. Meron, Israel. Lightning discharges are detected and analyzed, and their abundance is compared with theoretical predictions. We show how information about lightning location can be deduced from recorded waveform. Correlation with IS events is being examined as well. We conclude that lightning signals can be identified and filtered out, and thus the EM signal can be fused with the IS records to provide better performance of the CTBT monitoring system.

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