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Melcepstral Coefficients for Identification of Atmospheric Nuclear Explosions

Melcepstral coefficients have been extracted from a number of infrasonic hand-digitized atmospheric explosion waveforms from the 1962 Operation Dominic series of atmospheric nuclear tests. These explosions have a distinctive pattern of melcepstral coefficients which can be modeled with synthetically-generated waveforms consisting of a reflective phase from the surface and a direct arriving phase. From atmospheric explosions generated at the surface, and for bolides in the upper atmosphere, the distinctive pattern of the melcepstra coefficients due to surface reflections is missing. A discriminant using the melcepstra coefficients is proposed for the detection and identification of atmospheric nuclear explosions.

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