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**Misty Picture : A unique experiment for the interpretation of the
infrasound propagation from large explosive sources**

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In the framework of the Comprehensive Nuclear-Test-Ban Treaty, the International Monitoring System develops a 60 micro-barometric stations network. These stations, which records infrasound, detect various powerful natural and artificial sources like long range explosions, oceanic swell, and volcano eruptions. For data analysis, the CEA, in collaboration with the LMFA, develops specific methods based on measurements, data processing and numerical simulation. The Misty Picture experiment is a high explosive event (4685 Tons of ANFO) realized in 1987 in New Mexico (US). Infrasounds were recorded by 22 sensors until a distance of 1000 km in a quiet background noise condition. Multi-reflected tropospheric, stratospheric and thermospheric phases are detected. Signals recorded near the source (1 km away) and observed in the geometrical shadow zone (between 150 km and 250 km from the point source) are of particular interest. This reference experiment very well documented is used to improve our understanding of the atmospheric propagation of infrasound as well as to evaluate our models. Using various methods such as ray tracing, parabolic equation and finite differences, we investigate effects of the wind, atmospheric absorption, nonlinearity, refraction, (2D and 3D) and scattering by small atmospheric scales on observed phase kinds, their travel time and their waveform.