

and analysis of explosions in an outdoor pyrotechnic site

Acoustic pressure signals recorded for numerous explosions and several azimuths in the vicinity of an outdoor pyrotechnic site of the South of France are used to validate a fully nonlinear numerical code. This code, based on direct simulation of Euler equations with a detonation model and state of the art numerical schemes, allows classifying relative effects of topography, vegetation, and meteorological conditions on blast-wave propagation in the near field of the source (~5km). To save computational time, the coupling between this full nonlinear model and a simpler linear acoustic model is shown to be efficient at long range. This tool is used to perform parametric studies to determine the most unfavorable meteorological conditions from an acoustic annoyance point of view. Indeed, anomalous propagation is present and observed toward the East. Furthermore, records at an experimental infrasound station about 300km away are analyzed.

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