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Remarks on a blast sound propagation model for noise management purposes at military training areas

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Germany will introduce a daily shooting noise management at its military training areas. Roughly speaking, this management adopts the basic ideas of ISO 17201-5 but uses in addition a rating scheme that allows 18 exceedance days per year (5%). For management purposes, the underlying sound prediction scheme must support two decision (1) Whether or not, the noise load of the daily planned occupancy is within certain noise limits. (2) Whether or not, the daily changing occupancy is close to a low noise minimum for the requested training options.

The propagation model must consider particular weather conditions and the terrain shielding to enable the operator to optimise the occupancy with respect to these important conditions on a daily basis. The prediction must be fast enough to run several alternatives within minutes. Therefore, the prediction could not base on a sophisticated physical propagation model but must be done along a reasonable technical scheme.

This paper discusses a ray tracing approach that is expected to substitute the currently in-use formula based on fitted empirical parameters. This model will at least provide one parameter to describe the sound refraction (radius of curvature) and a rule on how to estimate up wind propagation.