

A Practical Approach for Estimating Sound Propagation of Artillery Projectile Noise

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Received: 18.6.2017 ; Revised : 2.7.2017 ; Accepted : 18.7. 2017

Abstract. Generally, a supersonic projectile generates an acoustical shock wave along its trajectory. This projectile sound is only audible in the Mach region area. The geometry of this area depends on the projectile speed relative to the speed of sound. At some distance from the projectile, the shape of the waveform is the typical N-wave shape. Projectile noise is one component of firing noise, which can be an important factor in environmental noise. The pressure prediction depends on the diameter, length and shape of the projectile and on the local Mach number. Due to non-linearity, the spectral energy content is not constant but depends on distance. Based on these principles, a practical approach for estimating projectile noise has been modeled. The approach takes into account the dimensions of the projectile, the projectile speed, weather and terrain conditions. In this paper the model has been described and compared with the open source available experimental data for large caliber artillery field gun system.

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