

Prediction of the Micro-Pressure Waves Using an Unsteady Acoustic Analysis

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The micro-pressure waves (MPWs) radiated from the tunnel portal are numerically analyzed by the unsteady acoustic analysis. Two types of the hoods are considered. Each type of the hood is different in length and has different number of openings. First, the shape of the compression waves at the tunnel entrance are decided by the linear acoustic analysis. Next, the unsteady deformation of the compression waveform accompanying tunnel propagation is calculated by the 1D theoretical propagation equation. Finally, the radiated MPWs are calculated by point source approximation. From this research, it is shown that even if the difference in the waveform of the compression waves is slight at the tunnel entrance, it appears as considerable difference in peak value of the MPWs when the unsteady effects are considered.