

**Interior Explosive Sound Caused When a Train Encounters
a Compression Wave Inside a Tunnel**

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When a high-speed train encounters a compression wave with steep wavefront inside a tunnel, an explosive sound can be caused within the train. In this study, on-track measurements of the interior explosive sound within the train and the compression wave propagating through the tunnel were performed on Shinkansen line, and also a numerical simulation was performed for investigating distortion of the compression wave. By the results of the on-track measurements and the numerical simulation, it has been clarified that the magnitude of the interior explosive sound becomes large with the increase of the pressure gradient of the compression wavefront. Furthermore, the results of the numerical simulation show that the countermeasures for reducing the pressure gradient of the compression wavefront generated by the opposite train entry are effective for reducing the magnitude of the interior explosive sound within the train.