

Researchers learn more about reducing noise in tire systems by altering belt structure

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In recent years, the knowledge about the influence of tire noise on vehicle noise, vibration, and harshness (NVH) has increased. Hence, studies have focused on tire noise.

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The research article *Study of the Influence of Tire Belt Structure on Vibration Noise* focuses on an analysis of the influence of the belt structure on [tire](#) vibration and noise keeping in view the relevant physical laws. The TBR 295/80R22.5 tire was selected for this study, and the effects of the width and angle of the belt on the vibration noise were studied using the Modal Acoustic Transfer Vector (MATV) technique and the Boundary Element Method (BEM). The results indicate that tire belt structure has considerable effect on vibration noise. When the belt structure was optimized, vibration noise declined by 7.55 dB, the vibration noise sound pressure peak shifted to a higher frequency, and the acceleration peaks of the tread and sidewall decreased. The influence of the belt structure on the acceleration of the tread was mainly reflected in the middle-frequency band; however, for the sidewalls in the high-frequency band, the fluctuation and peak of the optimized excitation force spectrum, especially the 440-Hz power spectrum, decreased considerably.

This study reveals the influence of belt structure parameters on the vibration noise. The finding in this paper provides a theoretical basis for the development of low-[noise](#) tires in the future.

More information: Haichao Zhou et al, Study of the Influence of Tire Belt Structure on Vibration Noise, *Recent Patents on Mechanical Engineering* (2017). DOI: [10.2174/2212797610666170817095107](https://doi.org/10.2174/2212797610666170817095107)

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