

عنوان مقاله:

Redution of Tire Noise by Modifying Tread Pattern

محل انتشار:

دهمین کنفرانس بین‌المللی آکوستیک و ارتعاشات (سال: 1399)

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خلاصه مقاله:

The complexity of generation and amplification tire/road noise mechanisms has made it difficult for tire builders to reduce emitted sound. Statistical methods help to model complex problems. This paper predicts tire noise level by a superior regression method in machine learning, relevance vector machine, with an error of 0.62 dB(A) in predicting total noise level. This accurate model is employed to analyze the tire's noise sensitivity to its parameters using a small central composite design. For a case study, grooves' depth has been recognized as a critical factor in controlling tire noise. The interaction of this parameter with length, width, and the number of transverse grooves, based on the variance analysis results, has also been identified as significant. According to the parametric study's striking tips, two sets of tread pattern specifications are proposed for noise reduction, utilizing the response surface method. They reduce the noise level by 1.72 and 1.54 dB(A) for a tire with a measured noise of 75.88 dB(A).

کلمات کلیدی:

tire noise; noise prediction; noise reduction; sensitivity analysis

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