



A hearing model approach to roughness

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ABSTRACT

The roughness-induced sound perception, varying from a sporty character to a very unpleasant impression, proposes consistently new questions and challenges in sound engineering. Existing roughness models work well for synthetic signals such as modulated tones or noise signals, but it is challenging to predict roughness for technical sounds because of their complex spectral and temporal noise patterns. Currently, a standard for the computation of roughness related to synthetic as well as technical sounds is under discussion in a DIN working group. One of the considered candidates is based on the hearing model of Sottek explaining and describing many psychoacoustic effects, and allowing for the roughness calculation of synthetic and engine sounds in accordance with listening test results. In recent listening tests, the participants showed consistent overall roughness evaluations of synthetic signals but heterogeneous judgments concerning complex technical sounds containing different rough components. The results of the listening tests will be discussed and compared with the evaluation by an improved hearing model approach to roughness.

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