

## **Perception of roughness of time-variant sounds**

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Besides loudness, other psychoacoustic parameters like sharpness and roughness are important for sound quality evaluation. Sharpness considers the relationship between the loudness of high frequency components and total loudness, and roughness evaluates modulation characteristics. While loudness of stationary sounds has been standardized for decades, standards for sharpness of stationary sounds and for loudness of time-varying sounds have been published in 2009 (DIN 45692:2009-08) and 2010 (DIN 45631/A1:2010-03), respectively. In addition, there are several roughness models available, performing more or less well for synthetic and selected technical signals. Currently, a roughness standard is under discussion in a DIN working group. In recent listening tests, the subjects showed consistent overall roughness evaluation of synthetic signals but heterogeneous judgments concerning the more complex technical sounds containing distinct rough components. The results of the listening test will be discussed and compared with the evaluation by several models like the roughness calculation using the hearing model of Sottek and an approach based on a psychoacoustically weighted modulation spectrum.

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