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Title

Particular Importance of Psychoacoustics for Sound Design of Quiet Vehicles

Special Session:

Quiet Vehicles

Abstract

It is important to accept that new constraints and new drive concepts are emerging in the automotive field, which requires a general rethinking. One major aspect concerns the vibro-acoustic comfort of quiet vehicles with respect to interior as well as exterior vehicle noise. Sound quality of vehicles still contributes greatly to the perceived overall quality of a vehicle and therefore must be extensively optimized. The sound optimization process is exceedingly important with respect to electric vehicles, since inappropriate sounds could lead to the complete rejection of such a new technology. Therefore, it is imperative to deal with acoustical problems and conflicts right from the beginning. Besides the avoidance of disturbing sounds, the challenging objective is to determine adequate vehicle sounds tailored to suit the auditory expectations and needs of the customer. This requires virtual engineering coupled with subjective testing in order to find target sounds. This is true although or even because of the reduced sound pressure levels of electric cars. Annoying and displeasing noise patterns gain remarkably in importance in quiet vehicles. Here, the use of psychoacoustics is imperative to grasp perceptive meaningful noise phenomena and to design sounds adequately. The paper will discuss the importance of psychoacoustics in the field of automotive acoustics and will present selected applications to stress the need for advanced tools and analyses in the context of quiet vehicles.

Keywords: sound quality, psychoacoustics, vehicle interior noise, electric vehicles

INCE CLASSIFICATION OF SUBJECTS: 61 Perception of sound

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