Euronoise 2012

SS: NS1 Acoustically Green Road Vehicles and City Area

Title:

Measuring and analyzing road traffic noise

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Abstract:

The European-funded CityHush project aims at the implementation of quiet zones with noise levels approx. 10 dB(A) lower than before. The development of alternative drive concepts (quiet electric or hybrid vehicles) opens a multitude of opportunities for reducing noise levels in cities. But, in order to fully utilize the noise reduction potential, holistic noise and vibration abatement approaches must be applied addressing issues like tire-road noise, vehicle-type-oriented access concepts, psychoacoustic analyses, and infrastructures as well as comprehensive emission considerations and soundscape concepts.
As part of the project, a microphone array system including a camera module is being developed allowing for detection, separation and quantification of the various vehicle noise sources (e.g. tire road interaction, engine, exhaust, etc.) contributing to the overall noise of road traffic, which consists of many individual vehicles. The combination of optical and acoustical information will be used for identifying the noise sources of each passing vehicle. One major issue concerns the detailed acoustical analyses and psychoacoustic evaluations of hybrid and electric vehicles under various running conditions, beyond simple sound pressure level considerations. Moreover, by using extensive measurement data, a traffic noise synthesizer for generating pass-by noise of quiet vehicles as well as complete traffic scenarios with different vehicle types, numbers and speeds is developed. The synthesis tool allows not only for calculation of acoustical indicators from virtual traffic scenarios, but also for binaural auralization of the resulting noises. This tool offers manifold possibilities with regard to urban planning.

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