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Road pavement classification based on noise emission characteristics

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The measurement procedure to evaluate the influence of road surface characteristics on vehicle and traffic noise is designated by Close-Proximity (CPX) method, as described in the ISO 11819-2 draft. This procedure consists on acquiring the vehicle rolling noise signal near the tires and close to the surface by means of at least two microphones, in a special arrangement for the determination of the Close-Proximity Sound Index (CPXI). Road traffic noise is estimated by taking into account the absorption characteristics of road surface on the propagation of sound and the speed and type of vehicles. However, the particular characteristics of the different pavement types, which may influence the sound radiation, are not considered. The main goal of this research is to identify and classify different types of road pavements, for different stress conditions, using the CPX method. Such information can be used as a guideline for calibrating noise mapping models in order to achieve more realistic and accurate results. The classification of the different road surfaces consists on a supervised learning technique based on the Support Vector Machine, SVM, algorithms. Results based on error analysis are presented and discussed.