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Title:

Tonal component separation of e-vehicles using the High-resolution Spectral Analysis (HSA)

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Abstract:

E-vehicles can generate strong tonal components that may disturb people inside the vehicle. However, such components, deliberately generated, may be necessary to meet audibility standards that ensure the safety of pedestrians outside the vehicle. A tradeoff must be made between pedestrian audibility and internal sound quality, but any iteration that requires additional measurements is costly. One solution to this problem is to modify the recorded signals to find the variant with the best sound quality that complies with regulations. This is only possible if there is a good separation of the tonal components of the signal. In this work a method is proposed that uses the High-resolution Spectral Analysis (HSA) to extract the tonal components of the signal, which can then be recombined to optimize any sound quality metric, such as the tonality using the Sottek Hearing Model (standardized in ECMA 418-2).

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