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Title:

Quantifying Harmonic Distortions in Audio Playback Systems

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Abstract:

One of the perceptually (and commercially) relevant attributes of audio playback systems is the amount of nonlinear distortions that they produce. This can be assessed by auditory tests. The downside of this approach is that they are expensive and time-consuming. Accordingly, it would be beneficial to also have an instrumental assessment method that provides similar results as an auditory test but without actually conducting one.

In recent years, an auditory test design and an approach for instrumental assessment of audio systems have been proposed. The distortions are one of the attributes that are featured in both – and they have proven challenging for instrumental assessment.

In this contribution, a novel analysis stage for quantifying the amount of harmonic distortions is presented. It is derived from the spectrogram of a sweep measurement by means of a Radon transform with additional post-processing stages. It is explained how the post-processing removes noise components from the data by exploiting the properties of both the transform and the sweep measurement. Finally, the correlation between the auditory results and the output of the analysis stage is investigated.

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