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Refinement and validation of the binaural short time objective intelligibility measure for spatially diverse conditions

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Abstract

Speech intelligibility prediction methods have recently gained popularity in the speech processing community as supplements to time consuming and costly listening experiments. Such methods can be used to objectively quantify and compare the advantage of different speech enhancement algorithms, in a way that correlates well with actual speech intelligibility. One such method is the short-time objective intelligibility (STOI) measure. In a recent publication, we proposed a binaural version of the STOI measure, based on a modified version of the equalization cancellation (EC) model. This measure was shown to retain many of the advantageous properties of the STOI measure, while at the same time being able to predict intelligibility correctly in conditions involving both binaural advantage and non-linear signal processing. The biggest prediction errors were found for conditions involving multiple spatially distributed interferers. In this paper, we report results for a new listening experiment including different mixtures of isotropic and point source noise. This exposes that the binaural STOI measure has a tendency to overestimate the intelligibility in conditions with spatially distributed interferes at low signal to noise ratios (SNRs). This condition-dependent error can make it difficult to compare intelligibility across different acoustical conditions. We investigate the cause of

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