ACOUSTICS2008/3181
Model-based objective assessment of noise reduction systems for hearing aids

Birger Kollmeier[a], Rainer Huber[b], Thomas Rohdenburg[a], Rainer Beutelmann[a] and Volker Hohmann[c]
[a]Universität Oldenburg, Medizinische Physik, Carl-von-Ossietzky Str. 9-11, 26111 Oldenburg, Germany
[b]Kompetenzzentrum HörTech, Marie-Curie-Str. 2, 26129 Oldenburg, Germany
[c]Carl von Ossietzky Universität Oldenburg, Ammerländer Heerstraße 114-118, 26111 Oldenburg, Germany

Since the ultimative goal of hearing-aid development is the (subjective) judgment of the individual hearing-impaired listener, time-consuming tests with the end user are indispensable. However, time- and effort-saving objective methods to assess the potential benefit of different versions and parameter sets of hearing aid algorithms are gaining importance. This contribution reviews perception-model-based approaches to predict the hearing-impaired judgement and speech reception performance achieved with various noise reduction schemes. The perceptual similarity measure PSM evaluates the similarity between a tested condition and an "ideal" reference condition not on the physical level, but rather on the perceptual level at the output of a perception model for the individual hearing-impaired listener. The binaural extention of the SII approach uses a binaural preprocessing stage followed by a speech intelligibility index (SII)- based prediction scheme capable of predicting the relative benefit of binaural signal presentation and signal enhancement in complex spatial signal and noise source configurations. Both model-based schemes can be combined to assess the effect of noise reduction algorithms (such as adaptive beamformers) and to optimize their respective performance for different acoustical situations.