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Hearing instruments - The use of both ears

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The intrinsic beyond-amplification aspects of hearing loss can not fully be circumvented in modern hearing aids. Therefore, preprocessing of the input signals is important and aims at the presentation of a signal that is clearer or easier to understand, to further hearing aid stages. Multi-microphone configurations and additional (adaptive) signal processing in modern hearing aids have been shown to improve speech reception in a number of (some but not all) listening conditions.

However, it has been confirmed also in the last few years that improvements in one domain of perception (e.g. speech intelligibility) may result in decrease of performance in another dimension (e.g. localization). With the advent of bilaterally linked hearing instruments there is an increased interest in binaural signal processing schemes to allow more general improvements.

This contribution will report on recent advances resulting in enhancement of speech understanding in adverse listening environments combined with preservation of directional hearing with binaural adaptive signal processing on 2, 3, 4 (or more) microphone inputs. These binaural preprocessing schemes can equally well be applied in bilateral cochlear implants or bimodal bilateral systems.

