Effect of different frequency mappings on speech intelligibility for CI listeners

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The current generation of cochlear implants (CI) is not optimized for sound localization. However, improving sound localization ability should not hinder a cochlear implant's main function, to help the listener understand speech. The Oldenburger Satztest was used to test speech intelligibility in quiet and at different noise levels with CI and normal hearing (NH) listeners using a CI simulation. The experimental parameters that were varied were the number of analysis channels (M) and the number of electrodes or synthesis channels (N). Both "matched" (M = N) and "unmatched" (M ≠ N) conditions were tested. It was found that for the matched conditions the number of electrodes can be decreased from twelve to eight and speech intelligibility is hardly affected, even for the lowest signal-to-noise ratios. It was also found that for the unmatched conditions speech intelligibility was insensitive to small spectral changes but not large ones. The results have implications for new mapping strategies for CI listeners.