

ACOUSTICS2008/3162
Signal processing algorithms for speech in fluctuating noise

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Fluctuating background noise is a significant problem for listeners with sensorineural hearing loss (SNHL). Data indicate that fluctuating noise significantly affects both speech understanding and satisfaction with hearing aids. Listeners with SNHL do not take advantage of momentary dips in the noise and thus do not experience release from masking in fluctuating noise, as normal-hearing listeners do. Our results have shown that listeners with SNHL obtain about half of the masking release of their normal-hearing counterparts, and that this masking release is generally related to the audibility of the speech in the noise dips. Current slow-acting amplitude compression is based on the level of the background noise and does not improve the audibility of speech in the dips of fluctuating noise. Fast-acting multiband compression can improve audibility but may produce unwanted artifacts. Fast-acting algorithms based on spectral peaks shows potential for maximizing the audibility of speech in fluctuating noise to improve speech intelligibility, with limited artifact. Portions of this work are supported by the University of Minnesota and Starkey Laboratories.