

A. N. Cheeran, P. C. Pandey, and D. S. Jangamashetti, Optimal sweep cycle for binaural dichotic presentation to improve speech perception in sensorineural hearing impairment, J. Acoust. Soc. Am., vol. 111(5), p. 2426, 2002

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Abstract - In a previous investigation [P.C. Pandey et al., J. Acoust. Soc. Am. 110, 2705 (2001)], a scheme using binaural dichotic presentation was devised for simultaneously reducing the effect of increased temporal and spectral masking in bilateral sensorineural hearing impairment. Speech was processed by a pair of time-varying comb filters with passbands corresponding to cyclically swept auditory critical bands, with the objective that spectral components in neighboring critical bands do not mask each other and sweeping of filter passbands provides relaxation time to the sensory cells on the basilar membrane. Presently investigation is carried out to find the optimal value of the sweep cycle. Comb filters used were 256-coefficient linear phase filters, with transition crossovers adjusted for low perceived spectral distortion, 1 dB passband ripple, 30 dB stopband attenuation, and 78-117 Hz transition width. Acoustic stimuli consisted of swept sine wave and running speech from a male and a female speaker. Bilateral loss was simulated by adding broadband noise with constant short-time SNR. Listening tests with stimuli processed using sweep cycles of 10, 20, 40, 50, 60, 80, 100 ms, indicated highest perceptual quality ranking for sweep cycle in the 40-60 ms range, with a peak at 50 ms.