

A. N. Cheeran, P. C. Pandey, and D. S. Jangamashetti, Comb filters for Binaural dichotic presentation to improve speech perception by persons with bilateral sensorineural hearing impairment, J. Acoust. Soc. Am., vol. 110(5), p. 2705, 2001

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***Abstract* - Intelligibility of speech for persons with sensorineural hearing impairment gets reduced due to increased spectral masking. For persons with bilateral loss, improved speech perception has been reported with binaural dichotic presentation using comb filters having complementary magnitude responses, based on auditory critical bands. In this scheme, spectral components in adjacent critical bands do not mask each other as they get presented to different ears. The objective here was to design a set of comb filters with transition crossovers adjusted for a low perceived spectral distortion. For this, a slowly swept tone presented through the two comb filters should not have a change in its perceived loudness at crossover frequencies. Experiments showed that the change in loudness was negligible with crossover response lying between -4 dB and -6 dB with respect to passband response. With this constraint for response at the crossover frequencies, comb filters with responses corresponding to 18 critical bands were designed as 256-coefficient linear phase FIR filters, using frequency sampling technique. The filters have pass band ripple of 1 dB and stop band attenuation of 30 dB. These filters have resulted in improvement in speech quality and speech perception.**