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Abstract - **Speech analysis-synthesis in codecs and voice transformation often introduces distortion in the resynthesized output, particularly if the input is corrupted by noise. The harmonic plus noise model (HNM), particularly suited for voice transformation, divides speech signal into harmonic and noise parts. The harmonic part is synthesized by taking the summation of pitch harmonics up to a frequency called maximum voiced frequency, and the spectrum above this frequency is attributed to the noise part. Removal of nonharmonic components in harmonic part may result in noise rejection, while the errors in the estimation of harmonics may lead to distortion. Investigations were conducted to assess the speech enhancement obtainable through HNM on broadband noise corrupted speech signal. Listening tests showed that both the input and the resynthesized signals were perceived as distortion-free for SNR greater than 10 dB. In the 0–10 dB range, both the signals had no loss of intelligibility, but listeners rated the resynthesized signal as having higher quality. No enhancement was obtained for SNR values lower than 0 dB. Hence, for higher noise levels, spectral subtraction or other enhancement techniques should be employed along with analysis-synthesis.**