

## Binaural masking level difference as a function of noise bandwidth and noise delay

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### ABSTRACT

The human binaural system can exploit differences between the interaural phase of a noise and a target tone to improve detection thresholds. The maximum masking release is obtained for detecting an antiphase tone ( $S\pi$ ) in diotic noise ( $N0$ ). It has been shown in several studies that this benefit gradually declines as an interaural time difference (ITD) is applied to the  $N0S\pi$  complex. This decline has been attributed to the reduced interaural coherence of the noise. Here, we report detection thresholds for a 500 Hz tone in masking noise with up to 8 ms ITD and bandwidths from 25 to 1000 Hz. When reducing the noise bandwidth from 100 to 50 and 25 Hz the masking release at 8 ms ITD increases, in part because the narrower bandwidths result in a higher coherence length. For bandwidths of 100 to 1000 Hz, however, no significant difference was observed, indicating that an auditory filter with a bandwidth  $<100$  Hz is operational and produces identical coherence for this group. Thus, our coherence-based model requires an effective auditory filter bandwidth  $<100$  Hz, in line with established monaural models but in contrast to delay line-based models for  $N0S\pi$  detection.

Keywords: Binaural, Interaural Time Difference, Interaural Coherence

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