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**The effect of spectral overlap on sensitivity to interaural time differences**

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Cochlear implant users who have some residual low-frequency hearing in both their implanted and unimplanted ears may have access to interaural time differences (ITDs), which could provide a cue for sound source segregation. Speech intelligibility has been shown in simulation to improve under these conditions. However, implant patients who stand to benefit from ITDs may have a significant asymmetry in the configuration of loss in the low-frequency region. It is unknown how a difference in corner frequency of loss across ears will affect ITD sensitivity. As a first step toward characterizing this relationship, the present study measured ITD just-noticeable differences (JNDs) of bands of noise that varied in the amount of spectral overlap across ears in five normal-hearing listeners. In one ear, the center frequency was 250 Hz, and the bandwidth was either 1/3 or 2/3 octaves. In the other ear, the center frequency was 250, 281, 315, 354, 397, or 794 Hz, and the bandwidth was 1/3 or 2/3 octaves. Results showed that although ITD JNDs increased as spectral overlap decreased, ITDs were only detectable so long as some spectral overlap was present.