

ACOUSTICS2008/3260
Lateralization of unidirectional frequency sweeps at high frequencies

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The ability to lateralize FM sweeps at high frequencies was investigated in a 2IFC 2-down 1-up adaptive design. Four conditions were examined in which the unidirectional FM stimulus swept either up or down in frequency, and either linearly or logarithmically between 3 and 8 kHz with the onset frequency roved by 15% on each presentation. The signal was an interaural delay in the waveform's fine-structure and hence its instantaneous frequency. The waveforms to the left and right ears had simultaneous envelopes and were filtered with the inverse of the headphone transfer functions to eliminate frequency-dependent interaural level differences. Results showed that sweep durations exceeding 25ms produce near-chance performance. Thresholds monotonically improved with increasing sweep rate to a lower asymptote of approximately 100 microseconds. Counterintuitive reversals of lateral position percepts were observed for down-sweeps which were inconsistent with lateralization based on envelope outputs of frequency-matched filters.