

**THE EFFECTIVENESS OF MULTIPLE HARMONICS IN  
ELICITING THE PRECEDENCE EFFECT IN  
NORMAL-HEARING LISTENERS**

By

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## ABSTRACT

Localization dominance due to the precedence effect refers to the ability of listeners to localize a primary auditory event in the presence of reflected sound. It has been shown that localization dominance becomes more stable as the bandwidth of a noise burst increases, which suggests the role of cross-frequency interactions on localization dominance. Currently, little is known about how stimuli containing multiple harmonics influence localization dominance. The present investigation uses a series of varying multiple harmonic complexes to investigate localization dominance due to the precedence effect. The effect of on- and offset cues are additionally investigated to determine the role of competing inter-aural temporal and level cues in listener responses. Listeners locate the perceived lateral position of stimuli presented binaurally via headphones by adjusting the interaural-level difference (ILD) that approximates the location of the stimulus. Stimuli are presented as lead and lag signals that simulate direct and reflected sound, respectively. The inter-stimulus interval (ISI) is varied from 0 to 8 ms. For all stimuli, localization dominance is observed. For test stimuli containing fewer harmonics physical ILDs occur as a result of lead/lag interference, but in the case of the denser harmonic complexes, the ILD often does not average out over frequency, as is the case for broadband noise. Listeners demonstrate diverse strategies to locate a primary source when confronted with competing inter-aural information.