The ratio of direct to reverberant sound energy (D/R) has been shown to be a primary acoustic cue to perceived sound source distance. Because it is unclear exactly how D/R might be encoded in the auditory system, a variety of physiologically plausible correlates to D/R have been identified, including amplitude modulation (AM), interaural time differences (ITD), and interaural level differences (ILD). Following recent work noted by Kowalski and Kim (2014), we describe a new correlate to D/R and perceived distance related to the amplitude modulation (AM) depth at the listener’s location. This cue is caused by the change in the modulation transfer characteristics of the room as a function of source distance. Results from an apparent distance estimation task confirm the efficacy of this AM depth cue in a reverberant soundfield (approximate soundfield T30 = 3 s), when level cues are made ineffective. Distance estimates were found to be most accurate when the source signal (random band of noise centered at 6 kHz) had AM (32 Hz, 100% depth), and this facilitation was only observed in reverberation. The facilitation was most evident for monaural input, indicating that the AM depth cue is likely processed monaurally.

RESULTS

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