# Interaural Level Difference-Based Model of Speech Localization in Multi-Talker Environment

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Abstract: Horizontal localization is based on extraction of the interaural time and level differences (ITD, ILD). Even in complex scenes with multiple talkers and reverberation, the auditory system is remarkably good at estimating the individual talker locations. Several previous models proposed mechanisms that stressed the importance of ITD in the localization process. Here, we examine whether azimuth estimation in complex scenarios can be based solely on ILD. We implemented a model (based on Faller and Merimaa, 2004) in which azimuth estimation was based on ILDs of signal parts with high interaural correlation and with spectral profile matching that of the target. Comparison with experimental data (Kopco et al., 2010) showed that highly correlated parts of the signal, if available, provide reliable ILD estimates sufficient for precise target localization. However, for lateral target positions, at which the target dominates one ear but not the other, interaural correlation was too low to guide ILD extraction. In such cases, a new model based on finding maximum ILD provided good estimates even if maskers dominated in the worse ear. The combined model predictions matched the experimental data with target locations between -50° and 50° and for 4 maskers in reverberation.