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**The acoustical bright spot and the erroneous localization of tones  
by human listeners**

Brad Rakerd<sup>a</sup>, Zach Ryan<sup>b</sup>, Eric Macaulay<sup>b</sup> and William Hartmann<sup>b</sup>

<sup>a</sup>Michigan State University, Dept. of Communicative Sciences and Disorders, East Lansing, MI 48824, USA

<sup>b</sup>Michigan State University, Dept. of Physics and Astronomy, East Lansing, MI 48824, USA

In free-field sound localization experiments, human listeners estimated the locations of sine tones originating at 13 loudspeakers that spanned a range of azimuths from 0 degrees (straight ahead) to 90 degrees (extreme right). During the experiments the tone amplitudes and phases were measured in the listener's ear canals. Because of the acoustical bright spot, measured interaural level differences (ILD) were found to be a nonmonotonic function of azimuth at frequencies above about 1000 Hz. In source identification experiments at 1500 Hz, there was no correlation between estimated location and the interaural phase difference. There was high correlation with ILD, causing listeners to make large localization errors for azimuths greater than about 55 degrees. In a second experiment, listeners judged the direction of movement of sounds from one source to another. Errors in the second experiment could be well predicted from the localization responses in the source identification experiment. The ear canal measurements showed that, in principle, listeners could localize successfully by using the levels in the two ears independently. However, localization performance remained poor even after extensive training. Work supported by the NIDCD, grant DC00181.