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Prediction of spatial perceptual attributes of reproduced sound across the listening area

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Audio systems and recordings are optimized for listening at the 'sweet spot', but how well do they work elsewhere? An acoustic-perceptual model has been developed that simulates sound reproduction in a variety of formats, including mono, two-channel stereo, five-channel surround and wavefield synthesis. A virtual listener placed anywhere in the listening area is used to extract binaural signals, and hence interaural cues to the spatial attributes of the soundfield. Using subjectively-validated models of spatial sound perception, we can predict the way that human listeners would perceive these attributes, such as the direction (azimuth) and width of a phantom source. Results will be presented across the listening area for different source signals, sound scenes and reproduction systems, illustrating their spatial fidelity in perceptual terms. Future work investigates the effects of typical reproduction degradations.