

Acoustics and Psychoacoustics Applied - Part 1: Listening room design

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The diffuse reflection room (cont.)

So diffusion can result in a reduction of the amplitude of the early reflection from a given point. However, there will also be more reflections, due to the diffusion, arriving at the listening position from other points on the wall, as shown in Figure 7.15.

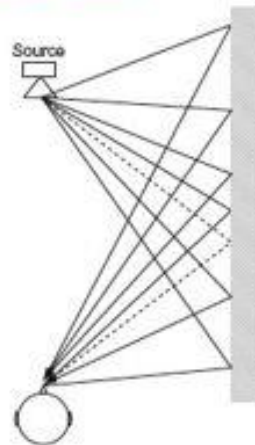


FIGURE 7.15 Additional early reflection paths due to a diffuse surface.

Surely this negates any advantage of the technique? A closer inspection of Figure 7.15 reveals that although there are many reflection paths to the listening point they are all of different lengths, and hence time delay. The extra paths are also all of a greater length than the specular path, shown dashed in Figure 7.15.

Furthermore the phase reflection diffusion structure will add an additional temporal spread to the reflections. As a consequence the initial time delay gap will be filled with a dense set of low-level early reflections instead of a sparse set of higher level ones, as shown in Figure 7.16. Of particular note is that, even with no added absorption, the diffuse reflection levels are low enough in amplitude to have no effect on the stereo image, as shown earlier in Figure 7.9.