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Acoustic Room Impulse Response Computation with Image Sources and Frequency Dependent Boundary Reflection Coefficients

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Abstract : A computational model of the acoustic room impulse response between transmitters and receivers located in an enclosed cavity under the influence of frequency-dependent reflection coefficients of the walls is presented. The characteristic features of the impulse responses that differentiate these results from frequency-independent reflecting surfaces are discussed. The image-source model is derived from the first principle solution to Green's function of the acoustic wave equation. The post-processing of the computed impulse response with a band-pass filter to better represents the response of a loud-speaker is demonstrated.

Keywords : acoustic room impulse response, frequency dependent reflection coefficients, Green's function, image model
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