

Estimation of the Human Absorption Cross Section Via Reverberation Models

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Abstract:

Since the presence of persons affects the reverberation time observed for in-room channels, the absorption cross section of a person can be estimated from measurements via Sabine's and Eyring's models for the reverberation time. We propose an estimator relying on the more accurate model by Eyring and compare the obtained results to those of Sabine's model. We find that the absorption by persons is large enough to be measured with a wideband channel sounder and that estimates of the human absorption cross section differ for the two models.

The obtained values are comparable to values reported in the literature. We also suggest the use of controlled environments with low average absorption coefficients to obtain more reliable estimates. The obtained values can be used to predict the change of reverberation time with persons in the propagation environment. This allows prediction of channel characteristics relevant in communication systems, e.g. path loss and rms delay spread, for various population densities.