Examining the relationship between total acoustic absorption and late lateral sound level, GLL.

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Listener envelopment, the sense of being immersed in the sound field, has been shown to correlate with the objective parameter late lateral energy (GLL). Barron proposed that GLL is primarily a function of the ratio of reverberation time to auditorium volume, or the total acoustic absorption (Barron 2001 App. Acoust. 62:185-202). An investigation has been conducted to examine this proposed theory with measurement data and predicted values from a room acoustics computer modeling program. Room impulse response measurements have been taken in the Belding Theatre in downtown Hartford, CT. Features of the hall include variable absorption in the form of curtains, both within the hall and also within small adjacent coupled volumes. Measurements were taken in several absorption configurations. A detailed room acoustics computer model of the hall has been created in ODEON v9.22 to examine the accuracy of the model's prediction of GLL. The model was initially validated using the measured parameters of reverberation time (T30), early decay time (EDT), and clarity index (C80). A comparison of the measured and predicted results will be discussed, along with an analysis of the relationship between GLL and total acoustic absorption. [Work supported by a University of Hartford Greenberg Junior Faculty Grant.]

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