



Objective assessment of multipurpose enclosures equipped with active acoustic enhancement systems

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From the acoustical point of view various events require different acoustic conditions. Research on optimal acoustic parameter values that have been carried out for recent decades and the necessity to provide different acoustic solutions to events of a different type (e.f. symphonic concert or speech), led to construction of rooms with variable acoustics. In such rooms changes in parameters in multipurpose enclosures may be achieved by modifications of volume or the shape of a room, as well as through the use of appropriate acoustic treatments. However, one must bear in mind that those modifications are limited and frequently – insufficient due to the technical limitations. Therefore, nowadays, active acoustics systems based on signal processing and multisource redistribution of a modified signal in a room become more and more popular. Application of such systems allows for more precise and matching adjustments of acoustic parameters required for particular performance than with the use of the solutions mentioned above.

This paper presents results from measurement of objective parameters of multipurpose enclosures equipped with active acoustic enhancement systems. Investigated halls are located in Poland in the following cities: Łańcut, Mińsk Mazowiecki, Puławy, Wieluń and were intentionally built or renovated as multipurpose rooms. All of those were equipped with Yamaha AFC3 (Active Field Control version 3) acoustic enhancement system. The measurements were performed according to ISO338-1/2 standards. In total 13 active acoustic system settings (presets) were analyzed to investigate the influence of this system on room acoustic, namely Reverberation Time (RT), Early Decay Time (EDT), Bass Ratio (BR), Treble Ratio (TR), Initial Time Delay Gap (ITDG), Center Time (Ts), Clarity (C80, C50), Definition (D50), Interaural Cross Correlation (IACC) and Speech Transmission Index (STI).

The analysis of the obtained results showed that it is possible to obtain the appropriate acoustic conditions with acoustic parameters values set in the suggested range for a given event using active acoustic systems.