

## Wave-based modeling of acoustics of a barrel-vaulted sanctuary

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### ABSTRACT

This study investigates the acoustics of a recently constructed barrel-vaulted sanctuary, where design flaws resulted in excessive reverberation times and strong flutter echoes. Computer modelling with geometrical acoustics software was carried out, but was unable to reproduce reverberation times and highly non-diffuse effects (flutter echoes). Recently developed wave-based, finite-difference time-domain (FDTD) modelling software was also employed and found to better predict the acoustics of the space, which aided in offering acoustical modifications recommendations (adding ceiling panel absorbers) to correct reverberation times and suppress flutter echoes. Measurements and simulations will be presented.

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