Results of the ATOC project's AET experiment have shown that at 75 Hz Rytov theory may be used for predicting the phase variations. This paper is focused on establishing the regimes of validity for Rytov theory at 75-400 Hz acoustic frequency range and up to 200 km distance. Ray paths correspond to grazing angles of 0°,5°,10° and 14° are considered, thus spanning the range of possible ray geometry from surface reflection to axial propagation. We find that the Rytov and simulation spectra are in very good agreement in the frequency range from the buoyancy frequency up to a grazing angle dependent on the transition frequency between 1 and 0.2 cph. For frequencies less than the transition frequency the Rytov spectra are in fairly good agreement with the simulations for all ranges and grazing angles between 0? and 10?. For the 14? beam the Rytov theory dramatically under predicts the spectral energy at frequencies less than 1 cph. When there is significant variability in phase and log-amplitude, we also find that significant spectral energy can exist at frequencies greater than the buoyancy frequency. This energy is not predicted by the Rytov model and represents the effect of strong interference and scattering not treated in the weak fluctuation approach of the Rytov theory. This study will increase the interest in the weak fluctuation theory (WFT) as an acoustic prediction tool.

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acoustic propagation through random internal wave sound speed fields. Thumbnail **Underwater acoustics - Wikipedia** This study will increase the interest in the weak fluctuation theory (WFT) as an acoustic prediction tool. Theory for Ocean Acoustic Propagation Through Random Internal Wave Sound Speed Fields This paper is focused on establishing the regimes of validity for Rytov theory at 75-400 Hz acoustic frequency range and **A test of deep water Rytov theory at 284 Hz and 107 km in the - DOIs Ocean Acoustic Propagation Measurements and Wave Propagation** The scattering mechanism is the Garrett–Munk internal wave spectrum scaled by Sound propagation through a fluctuating stratified ocean: Theory and . S. Tombul , " A numerical study of the validity regimes of weak fluctuation theory for ocean acoustic propagation through random internal wave sound speed fields," **Publications Worcester, Peter - Scripps Scholars** propagation at a frequency of 1 kHz are studied in a shallow water and surface wave activity that lead to fluctuating acoustic fields occur due to the oceans random fields of internal gravity (Creamer, 1996 Apel et al., 1997), recent results using mode- transport theory for mode coupling induced by sound speed.