

ACOUSTICS2008/2955

Absolute intensities of acoustic shadow zone arrivals

Lora Van Uffelen, Peter Worcester and Matthew Dzieciuch
Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA 92093-0225, USA

Qualitative observations from bottom-mounted US Navy SOSUS receiving stations in the North Pacific reveal anomalously deep acoustic arrivals at travel times directly corresponding with timefronts expected to have turned much higher in the water column. The vertical structure of these shadow zone arrivals was studied during SPICEX, a long-range propagation experiment conducted from June to November 2004 in the North Pacific, utilizing moored sources 500 and 1000 km distant from two vertical line array receivers, which together virtually spanned the full ocean depth.

Comparison of the measured absolute intensities of shadow zone arrivals with Monte Carlo parabolic equation simulations suggest that the amount of internal wave scattering associated with the standard Garrett-Munk (GM) internal wave spectrum is not adequate to account for the extent of scattering into the acoustic shadow evident in the experimental data, suggesting either that the GM spectrum is not an appropriate representation of the internal wave field or that some other mechanism, such as oceanic spicule, may be also contributing to the scattering.