

ACOUSTICS2008/1606
Modeling higher order statistics of shallow water reverberation

Kevin Lepage

Naval Research Laboratory, 4555 Overlook Ave SW, Washington, DC 20375, USA

The modeling of the higher moments of shallow water reverberation is addressed for problems where non-Rayleigh reverberation is caused by scattering from rough boundaries with non-Gaussian height distributions. Expressions for the first three spatial moments of exponentially height-distributed roughness are derived for both Gaussian and exponential correlation functions corresponding to Gaussian or von-Karman second order spectra. The bi and tri-spectra for these roughness distributions are also derived, and differences are highlighted between these results and the results that are obtained for Gaussian height-distributed higher order spectra. Finally results for the higher moments of reverberation pressure are derived for exponentially height-distributed bottom roughness with the Gaussian spatial correlation function in the presence of multipath as a function of time, bandwidth, and correlation length scale. [Work supported by ONR]