ID: Type: **Oral**

# of distant quiet man-made sources and shadow zone arrivals of earthquakes

The ocean is nearly transparent for acoustic propagation at low frequencies (< 100Hz), leading to the detection of signals (seismic events, volcanoes and man-made signals) at distances as large as the ocean basin. Observations of a low level source transmission from Guam to Wake Island will be presented. Historically, basin acoustic modeling has neglected out-of-plane effects and has been performed with the model computed in the range/depth plane for multiple radials following geodesics (Nx2D). Out-of-plane effects include refraction and diffraction - which have different effects as well as different approaches to modeling. Experiments where 3D propagation effects were significant will be presented within this context, including Perth-Bermuda (1960), the Heard Island Feasibility Test (1993) and a recent seismic tomography test off the coast of Japan (2015). Three physics mechanisms will be addressed : horizontal deflection due to mesoscale eddies and fronts, reflection from islands (refraction) and diffraction behind bathymetric edges.

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Track Classification: Signal processing techniques for hydroacoustic event detection and evaluation