Applied Reverberation Modeling Workshop

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LONG TERM GOALS

Improve accuracy, fidelity, and speed of reverberation models for modeling, simulation, training and sonar system performance predictions.

OBJECTIVES

The objective is to achieve more efficient transitions from the 6.1 basic research community to the applied modeling community.

APPROACH

The approach is to: 1) develop enhanced understanding of 6.2/6.3 needs within the 6.1 community (emphasis on physics rather than signal processing); 2) develop long-term interactions between 6.2/6.3 and 6.1 researchers (addressing current/future Navy needs through FNC or alternate paths) and 3) identify topics that require long-term 6.1 basic research.

WORK COMPLETED

The PI worked closely with Ruth Keenan to analyze Fleet reverberation data in several regions (shallow, slope, and deep water) of operational interest and using operational reverberation models. In addition, the PI worked Joe Clemens (ARL-UT) to identify potential reverberation issues from Fleet (SSQ-53C) data. In some areas the Fleet reverberation predictions were very poor, tens of dB in error and work is underway to understand whether this is due to poor knowledge of environmental parameters or model phsyics problems.

IMPACT/APPLICATIONS

It is anticipated that improved understanding of the 6.2/6.3 modeling issues by the 6.1 community will lead to enhanced transition of modeling research from the 6.1 community. For example, a 6.1 reverberation model based on energy flux has just been delivered to NAVOCEANO and they are using it to estimate bottom scattering parameters from survey data to build a database. A new Navy shallow

water bottom scattering database is likely to be transitioned to OAML in FY13. That database relies upon accurate reverberation modeling for accurate estimation of the bottom scattering parameters.

RELATED PROJECTS

SPAWAR Ocean Bottom Characterization Initiative, One goal of this project was to develop a prototype bottom scattering database which could be used by the Fleet to replace the space and frequency-independent current model, Lambert's law with a Mackenzie coefficient.