

ACOUSTICS2008/1830

Short range geoacoustic inversion with a vertical line array

Yong-Min Jiang^a, Ross Chapman^a and Peter Gerstoft^b

^aUniversity of Victoria, 3800 Finnerty Rd, Victoria, BC, Canada V8W 3P6

^bMarine Physical Laboratory, Scripps Institute of Oceanography, 8602 La Jolla Shores Drive, La Jolla, CA 92093-0238, USA

During the SW06 (Shallow Water 06) experiments, short range geoacoustic inversion experiments were carried out at a source-receiver range of 230 m to determine the sea bed properties at fine spatial scales. Acoustic signals were collected at 16 hydrophones on a vertical line array from source depths of 15-65 m in 10 m intervals. For this experimental geometry, the angular coverage for reflectivity versus grazing angle is 7-25°. This paper combines the information extracted from low-frequency (100-900 Hz) and mid-frequency (1500-4500 Hz) LFM signals transmitted from the same source position to estimate multi-layered geoacoustic models. The model parameterization was based on the number of resolved sub-bottom reflections in the data. An inversion approach using adaptive simplex differential evolution was applied to the data to invert for the sub-bottom sound speeds and layer thicknesses. The temporal variation of the water column sound speed profile was included in the inversion. The estimated sound speeds are consistent with the range-averaged profile that was estimated previously from longer range data for the same radial path from the array. (Work supported by Office of Naval Research).