

# **ACOUSTICS2008/361**

## **Full field modelling of multi-aspect scattering from buried objects**

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Results are presented from a computational study of imaging of objects buried in the seabed under shallow water, using a rail-mounted active sonar and synthetic aperture processing. The medium is modelled as range independent, composed of a shallow water layer above a seabed of a muddy sediment containing the objects, and deeper subbottom layers. The objects have simple shape and structure, with diameters in the range 15-195 cm. From selected positions along the rail, the sonar insonifies the objects by LFM pulses from a directive transmitter, and records the backscattered echoes with a horizontal uniform line array (ULA), or optionally a pair of vertically separated ULAs. The signals from all sonar positions are integrated coherently by synthetic aperture processing for enhanced azimuthal resolution in the images of the objects.

The parameters of the models of the medium, the objects and the experimental geometry are chosen to approximate those of a sea trial conducted in the Stockholm archipelago in 2004. The model-predicted scattered field is computed using the XFEM-S code, based on a frequency-domain boundary integral equation (BIE) formulation of scattering from a smooth object in a layered fluid-solid medium. Comparisons of model predictions with experimental results are presented.