High Resolution Bistatic SAS Imaging

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Concepts for future minehunting systems include multiple unmanned subsurface or surface vessels operating from a “mother” platform for detection and identification of mine targets in shallow-water areas. For identification of detected targets, it is desirable to be able to obtain the best possible imaging of each target. ARL:UT has generated a significant data base of target echo data from approximately 15 mine targets and minelike false targets with the Rotating Seabed facility at the ARL:UT Lake Travis Test Station (LTTS). Nominal data parameters are 15-200 kHz frequency band, 3° to 18° D/E angle, and 0.2° spacing in target aspect around 360° of target aspect. The measurement geometry is equivalent to the realistic case of a mine target on the seabottom, with the sonar navigating in a circle around the target area. Related work has developed target imaging software using circular synthetic aperture sonar (CSAS) techniques, and examined imaging as a function of target type, acoustic parameters, orientation and aspect size, etc. The quality of the imaging is such that objects are identifiable from the CSAS images. This discussion will review the image processing techniques and results for the monostatic case, outline opportunities and processing modifications for the bistatic case, and describe proposed activities for FY04.