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Planar synthetic aperture processing (P-SAS) to real acoustic data of underwater imaging

Adel Jammali[a], Afif Belkacem[a], Kamel Besbes[a] and Manell Zakharia[b]

[a]Faculté des Sciences de Monastir μEi Lab Tunisia, Avenue de l'environnement, 5019 Monastir, Tunisia

[b]French Naval Acadamey, BP 600, 29240 Brest-Armees, France

Planar Synthetic Aperture technique has been validated on both simulated and tank data. It showed a significant improvement of 3D representation of bottom and sub-bottom. In this paper we present its application to real data acquired during sea experiments on a dump site. Data were acquired during the SITAR (Seafloor Imaging and Toxicity: Assessment of Risks caused by buried waste) project. The transmitter was a parametric array (TOPAS). Two central frequency were explored, 10 kHz and 20 kHz. The transmitter was fixed on a ROV which position was monitored. As P-SAS algorithm was designed for data obtained on a regular planar grid important modification were required to handle real sea data and "realistic" navigation conditions (irregular grid): a "re-arrangement" algorithm was designed for preprocessing actual data and correct for trajectory disturbances (in 2D). This algorithm is the re-projection of data to a new (virtual) regularly grid. The algorithm was validated on tank experimental data prior to application to sea data. Both conventional and SAS data will be presented. A strata representation technique was used for analyzing the seafloor, the sub-bottom and the localization of buried objects on a dump site in the Baltic sea.