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Geoacoustic inversion in the frequency range 0.8-1.6 kHz with drifting sparse arrays during MREA/BP'07 experiment

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In order to evaluate properly the acoustic propagation characteristics in shallow water environments, it is well established that appropriate knowledge of the acoustic properties of the seabottom is required. In the last decade, full-field geoacoustic inversion techniques have been demonstrated to provide adequate methodologies to assess those properties. However, several of the developed techniques may suffer a lack of adequacy to the design of low-frequency active sonar systems (LFAS) for which the assessment of seabottom characteristics are drawn. For instance most matched-field inversion techniques demonstrated so far use acoustical signals at much lower frequencies than those of the sonar. Furthermore, some of the techniques may be difficult to be handled in an "operationally relevant context" since they are based on relatively complex designed systems such as highly instrumented vertical line arrays spanning the whole water column. In this paper, we investigate the potential of medium-frequency acoustical signals (0.8-1.6 kHz) received at several ranges on a field of drifting sparse arrays, eventually reduced to a couple of hydrophones, for spatially-coherent geoacoustic inversion purposes. The experimental datasets of the Maritime Rapid Environmental Assessment MREA/BP'07 sea trial south of Elba Island in the Mediterranean Sea are used to support this study.