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Experimental study of parametric transmission : simultaneous generation of two beams

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In order to respond to the buried mines threat, an approach of GESMA (Groupe d'Etudes Sous-Marines de l'Atlantique) is to take advantage of the parametric transmission in sonar imagery. This technique allows producing narrow beamwidths at low frequencies. Such a parametric transmitter has been designed and calibrated in collaboration with an academic laboratory of Paris VI, and the targeted benchmark is fulfilled : 2° @ 20 kHz, with sufficient source level. The design of the complete sonar system is based on a sequential multibeam transmission associated with a synthetic aperture technique at receive. However, the shortfall of the sweeping technique lies in the timing limitation. One solution to increase the coverage rate is the simultaneous generation of several parametric beams in different directions. Experimentations have been conducted in a tank with different signals : CW, LFM, Ricker. This presentation addresses the results of these experimentations in the context of buried mines detection and classification.