

ACOUSTICS2008/1847
Effect of array element location on coherent inter-array processing

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In the SWellEx-96 experiment, two 25-elements horizontal arrays, each of length 250 m, were moored 3.5 km apart [N.O. Booth et al, IEEE, JOE, 25, no 3, July 2000]. A broadband source (50 to 400 Hz tones) was towed from 1 km to 10 km away from the arrays. The data is processed using the simple conventional plane-wave beamformer for all the cases covering incoherent frequency and incoherent inter-array processing to coherent frequency and coherent inter-array processing as a function of source position relative to the arrays. The effect of noise and array element location mismatch on source localization and coherent processing gain is investigated. An attempt to improve array element localization is made using a self-focusing technique. [Work supported by ONR.]