ACOUSTICS2008/2183
Spatial and temporal coherence of low-frequency acoustic field in shallow water: Experimental results

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Spatial and temporal coherence of acoustic field has very important effects on applications of underwater acoustics. In this paper, recent experimental results of low-frequency signal coherence in shallow water are presented. For signals with low frequencies of 100∼500Hz in shallow water, the vertical correlation has no distinct depth dependence, but it has obvious range dependence. The horizontal correlation length is greater than 40 wavelengths, the temporal correlation length is greater than 510s at frequency of 475Hz and greater than 1800s at frequency of 150Hz. These experimental results show that low-frequency acoustic field has strong spatial coherence and temporal stability in shallow water. [Work supported by the National Natural Science Foundation of China under Grant No.10734100]