ソーナー用区分開口合成技術

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Abstract

This paper proposes a new method in sonar signal processing using "Overlapping sectional synthetic aperture." This method is developed to provide high azimuth resolution in a synthetic aperture operation even when a ship cannot keep moving on a straight base line.The aperture direction is at first detected with a gyroscope and made parallel to the base line using mechanical feedback system. Signals from the overlapping part of two successive apertures overlapping in the base line direction with the lateral deviation in position are compared and the phase difference between two signals is detected. Signal of non-overlapping part of the second aperture is corrected using this phase difference. It is possible to obtain much higher azimuth resolution than a real aperture by repeating this procedure. This method does not require to change most of conventional sonar system and the signal processing is performed mostly using Fourier transform. Results of computer simulation prove the effectiveness of this method.