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Clutter Suppression Based on Singular Value Decomposition and Fast Wavelet Algorithm

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Abstract : Aiming at the problem that the target signal is difficult to detect under the strong ground clutter environment, this paper proposes a clutter suppression algorithm based on the combination of singular value decomposition and the Mallat fast wavelet algorithm. The method first carries out singular value decomposition on the radar echo data matrix, realizes the initial separation of target and clutter through the threshold processing of singular value, and then carries out wavelet decomposition on the echo data to find out the target location, and adopts the discard method to select the appropriate decomposition layer to reconstruct the target signal, which ensures the minimum loss of target information while suppressing the clutter. After the verification of the measured data, the method has a significant effect on the target extraction under low SCR, and the target reconstruction can be realized without the prior position information of the target and the method also has a certain enhancement on the output SCR compared with the traditional single wavelet processing method.

Keywords : clutter suppression, singular value decomposition, wavelet transform, Mallat algorithm, low SCR
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