

Time Reversal Based Multi-tone Imaging Algorithm

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We develop an direct imaging algorithm using an active array. This imaging algorithm is based on time reversal technique and principal component analysis of the response matrix for the active array. The key point is to locate and visualize strong scattering events. The algorithm is very simple and does not need any forward solver. Also multiple-frequencies and multiple-measurements can be superposed naturally. Resolution based thresholding can be used to deal with highly noisy data. Stability and accuracy of of the algorithm for extended target and in random medium will be demonstrated.