

# Adaptive Filtering to Measure Magnetoencephalogram

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We studied a noise cancellation method to measure magnetoencephalogram signals. The cancellation method consists of the adaptive filtering. To reduce environmental noise, the adaptive filtering technique uses the correlation of noises between the signal channel and reference channel. In the construction of algorithm, we assumed that the signal channels measure signal and noise simultaneously, while the reference channels measure noise only. To perform the adaptive filtering, we constructed a 7-channel system, which consists of single signal sensor measuring z-component, and six reference sensors measuring x, y and z components with two sensors in each direction. When we performed the adaptive filtering with the 7-channel system, we could get a good noise cancellation effect in the simulation and in the ideal case. But, in the case of auditory evoked fields, the filtering effect was not enough due to spatial nonlinearity of the noises. To increase the effectiveness of noise cancellation, we applied several cancellation methods and compared the characteristics each method.

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