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The definitive estimation of the neuronal current via EEG and MEG using real data

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Abstract

The medical significance of Electroencephalography (EEG), and Magneto-Electroencephalography is well established, see for examples [1, 2, 3, 5]. EEG and MEG are considered two of the most important imaging techniques for *real time* brain imaging. In order to generate images of the brain activation using either EEG or MEG, it is necessary to analyse certain mathematical inverse problems. The definitive answer to the inverse source problem for the case of EEG and MEG was finally obtained by [4]. Here, we present reconstructions of the current using *real data* via the formulation proposed by [4]. The data was provided by the medical research council (MRC) Cambridge, UK. It involves both auditory and visual stimulus. We show comparisons of the reconstructed irrotational component of the neuronal current using EEG measurements and the radial component of the neuronal current using MEG measurements. Based on the results, we argue that EEG imaging technology has the potential to become the dominant real time, low cost brain imaging tool.

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