# On biomagnetic inverse problems : Identification of an epileptic focus using magnetoencephalography

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Magnetoencephalography (MEG) is a noninvasive monitoring tool for brain activity that is widely used for analysis of brain functions and medical diagnosis. In particular, localization of an epileptic focus for ablative surgery is one of crucial applications of MEG, since extraordinarily strong currents flowing in the focus can be inversely estimated from the magnetic field measured outside a patient's head. In this talk, in order to separately identify a focal current source and background activities spread over the brain, we propose a novel source model for the MEG inverse problem that combines a parametric source model for a localized patch and a distributed source model for background activities. Using the proposed method, an epileptic focus was identified at the front of the temporal lobe, which coincided well with the estimated position using electrocorticography, in the presence of background activities spread over the occipital lobe, while the patch estimated by a conventional extended parametric approach shifted due to the effect of the background activities.