

DCM demo

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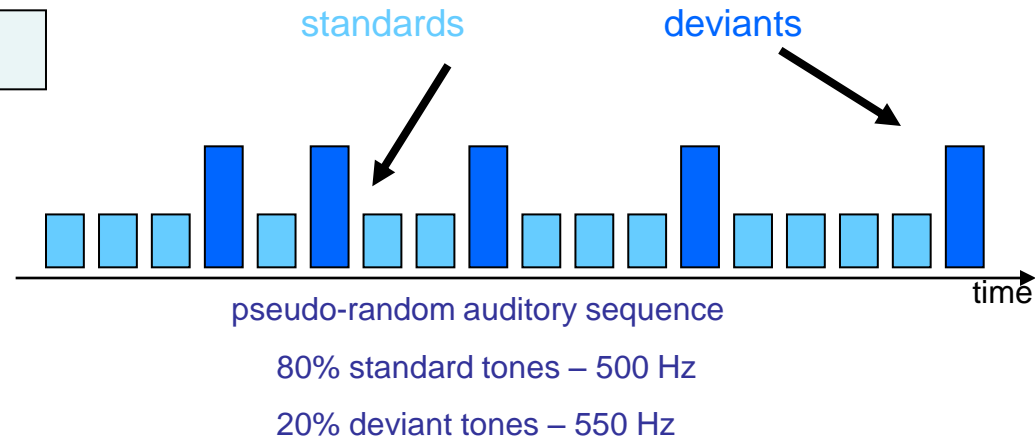


Wellcome Trust Centre for Neuroimaging



Mismatch negativity (MMN) – DCM Motivation

Paradigm

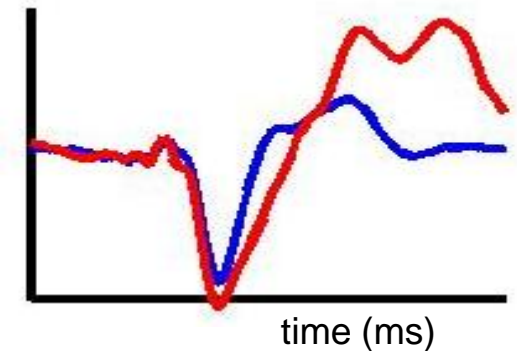


Raw data
(128 sensors)

Preprocessing
(SPM8)

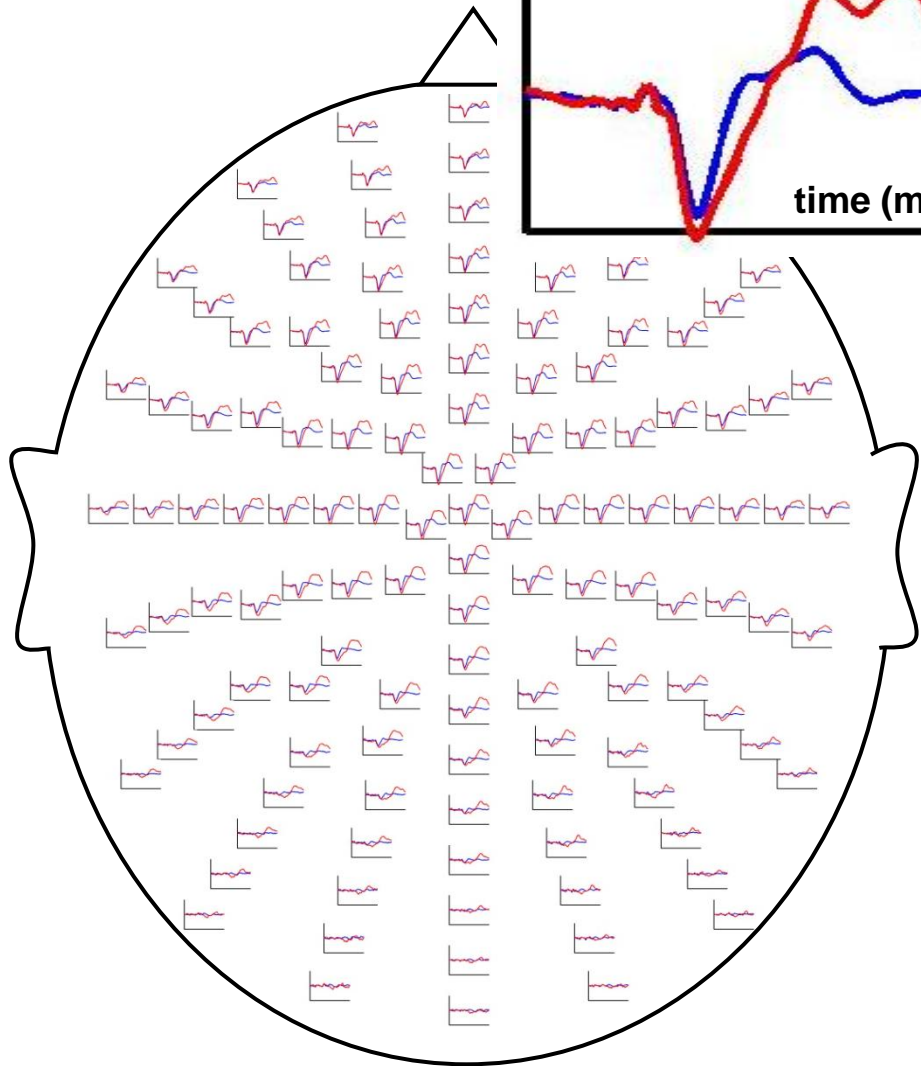
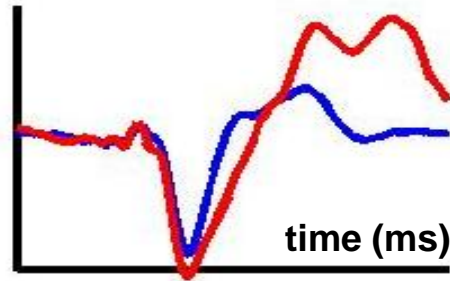
Evoked responses
(here: single sensor)

μV



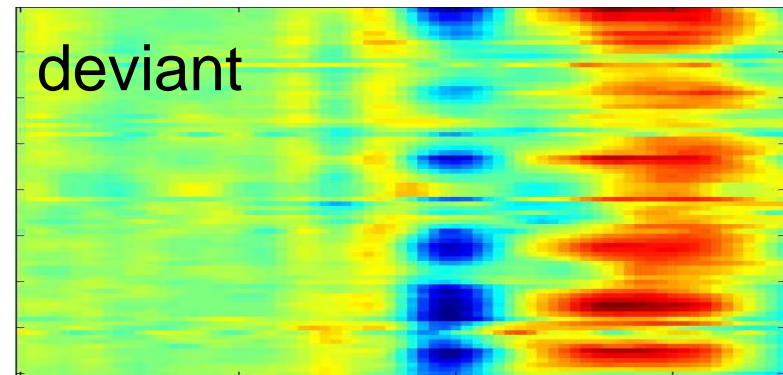
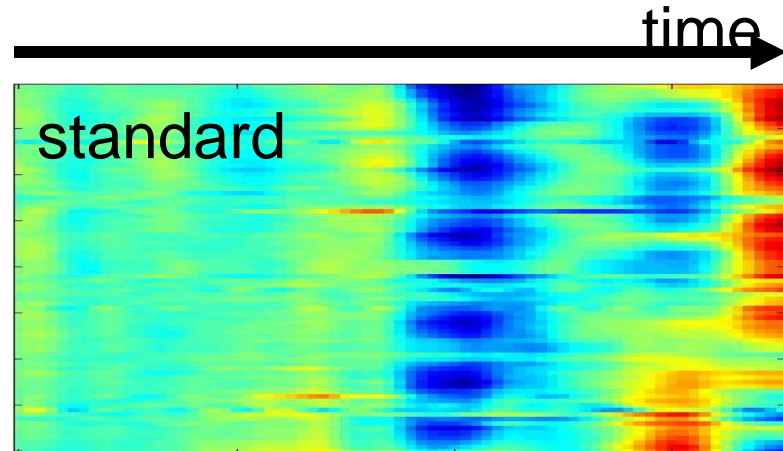
Electroencephalography (EEG)

amplitude (μV)

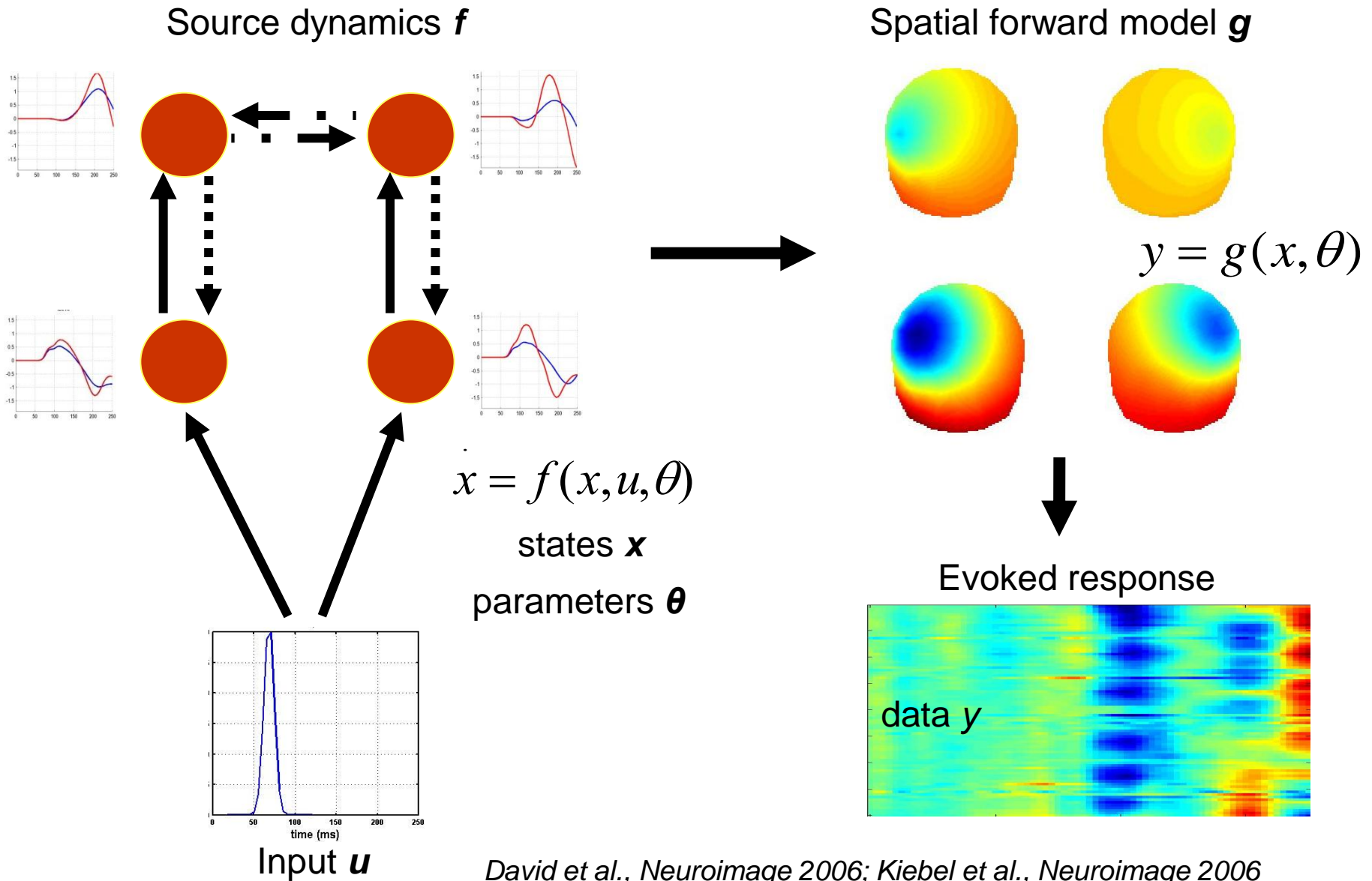


sensors

sensors

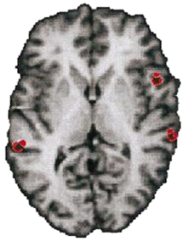


The generative model



DCM specification

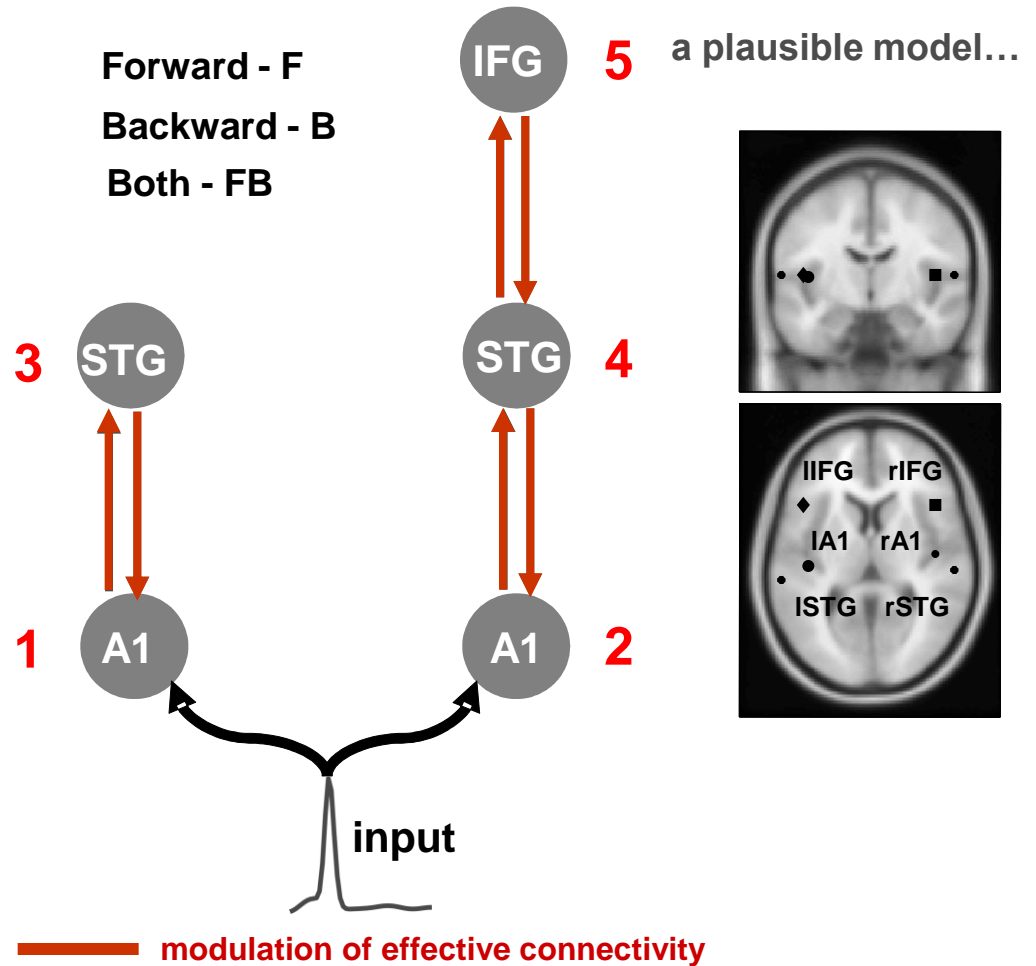
Hypothesis-testing for the mechanisms that caused the data



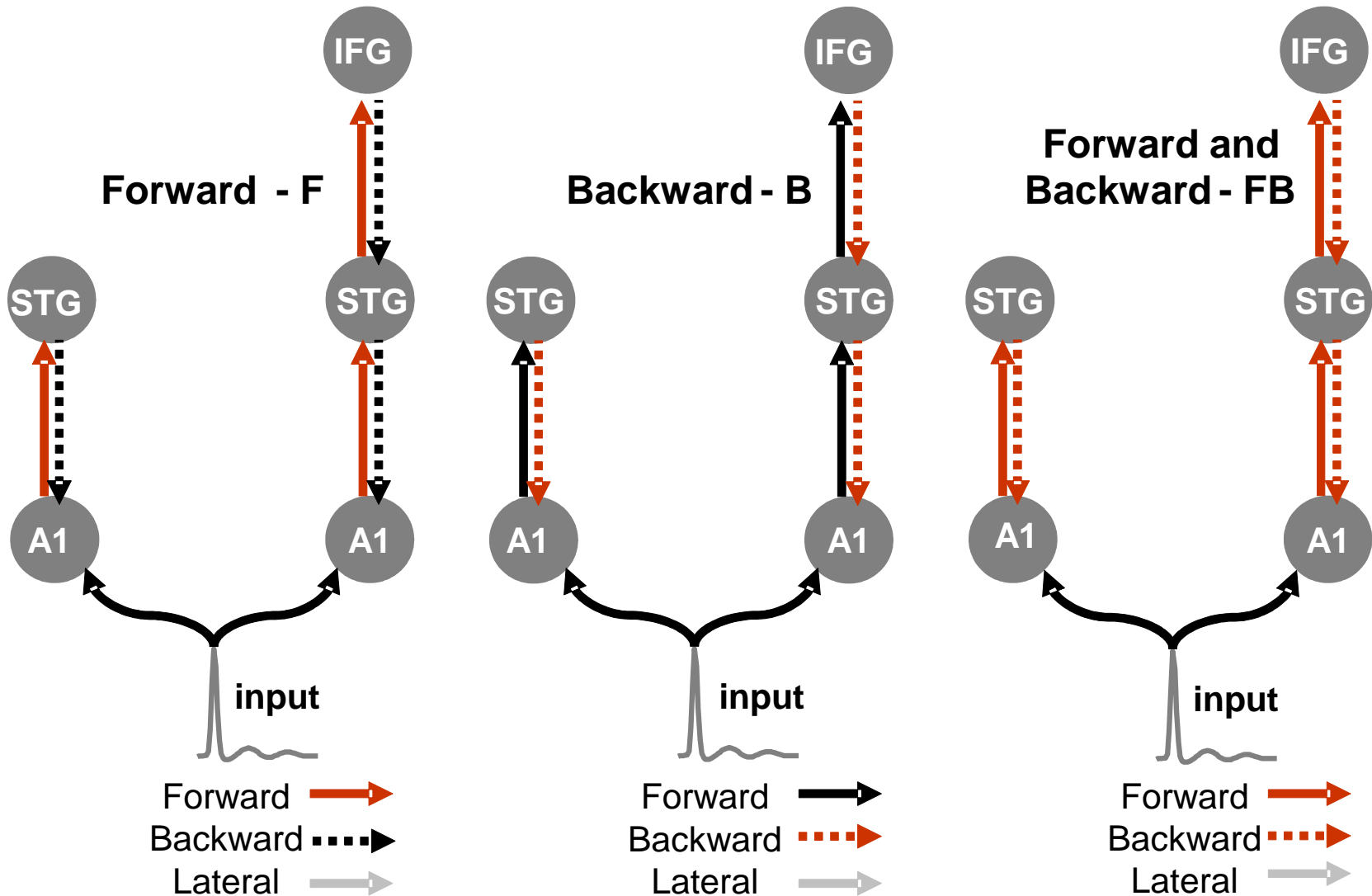
Opitz et al., 2002



Doeller et al., 2003



DCM specification – testing different models/hypotheses



modulation of effective connectivity

Analysis steps

1. Preprocessing and SVD decomposition
2. Model specification: guessing cortical areas and connections
3. Model inversion: finding the parameters that minimize differences between observed measurements and model predictions
4. Bayesian model comparison and statistical inferences on parameters from the best model