Pre-SPR EEGLAB Workshop – Portland OR, 2010

8:30 Welcome & brief EEGLAB overview (Scott, Arno)

9:30 Separating sources: ICA/Amica (Arno)

9:00 Seeing the data: Trial-by-trial Visualization using erpimage() (Julie)

10:00 Separating modes: Event-related time/frequency analysis (Scott)

10:30 Questions & Break

11:00 Separating modes: Event-related time/frequency analysis (Julie)

11:30 Comparing sources across subjects and conditions: IC clustering (Arno)

12:00 Worked examples (Scott)

12:15 Lunch Break

2:00 Neuroelectromagnetic forward head and inverse source modeling (Scott)

2:30 Modeling distributed brain dynamics: Information flow analysis (Tim)

3:00 Using EEG: Scientific brain-computer interface (BCI) design and neurofeedback (Christian, Julie)

3:45 Tea/Coffee break

4:00 What's next? Imaging coordinated brain and body dynamics (Scott)

4:30 Discussion (all)

5:00 Close

Human Functional Brain Imaging

EEG

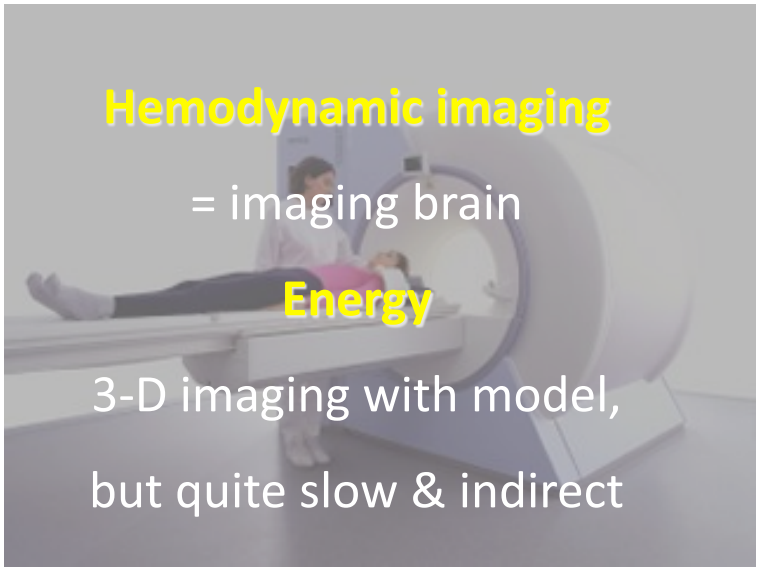
ERP

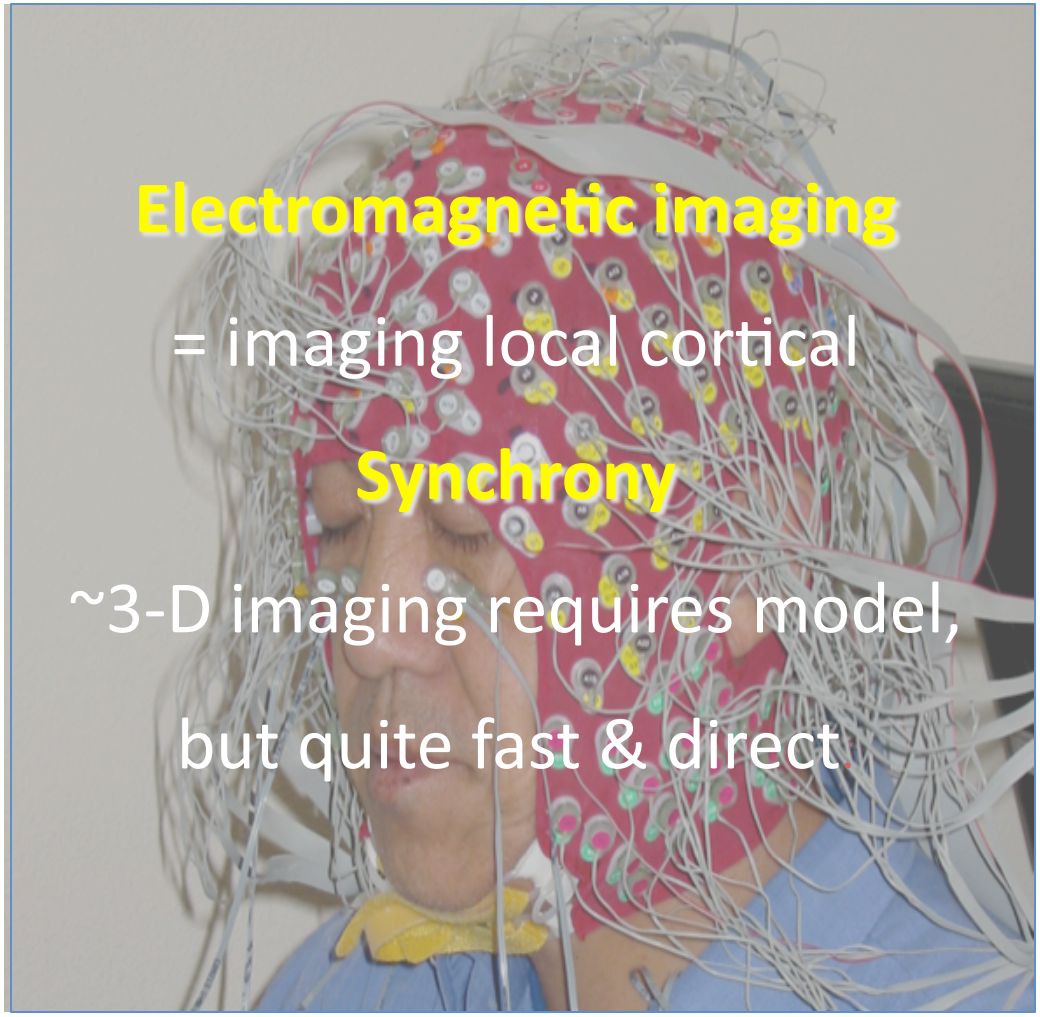
fMRI

fEEG

BCI

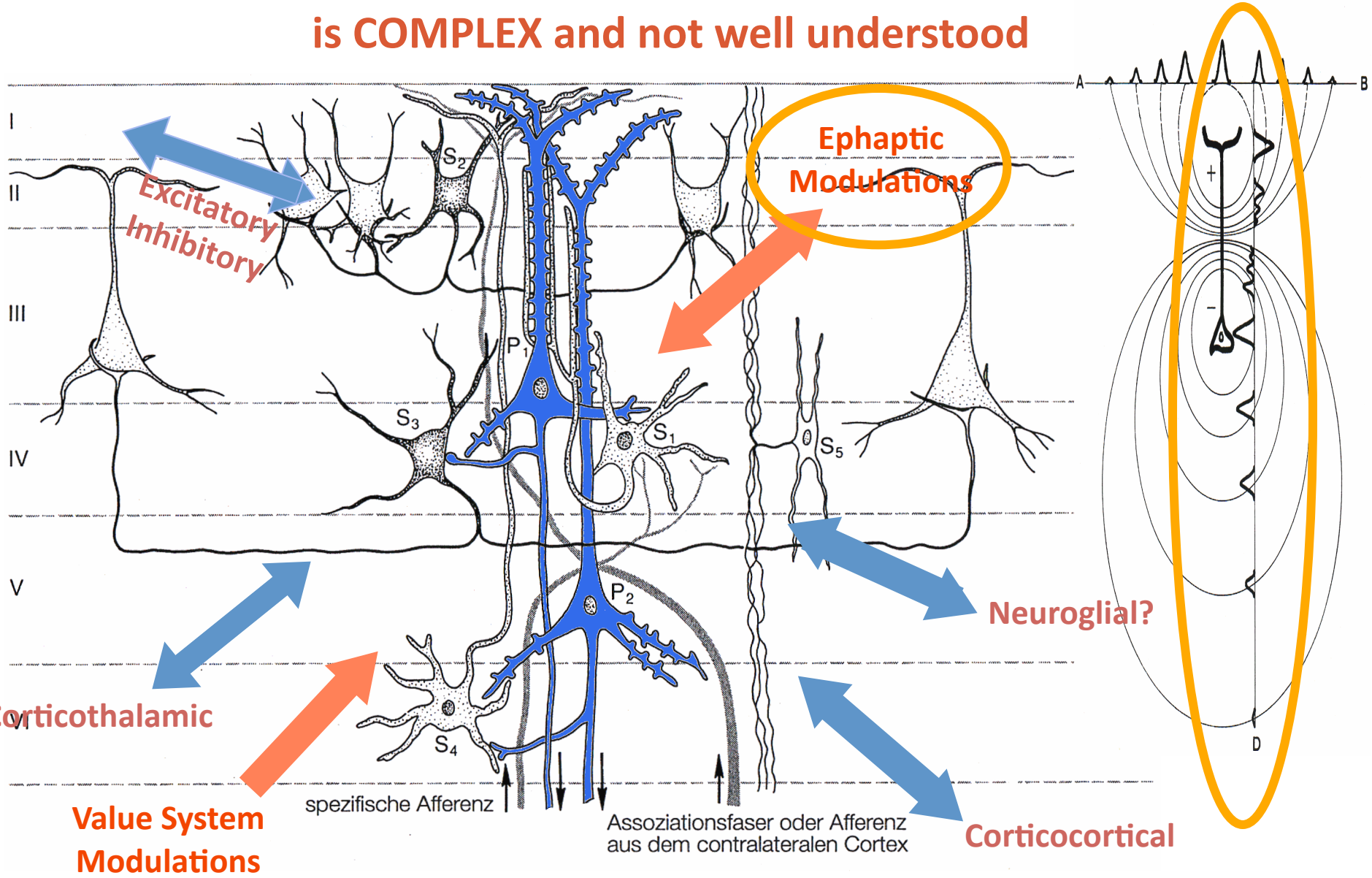
MoBI



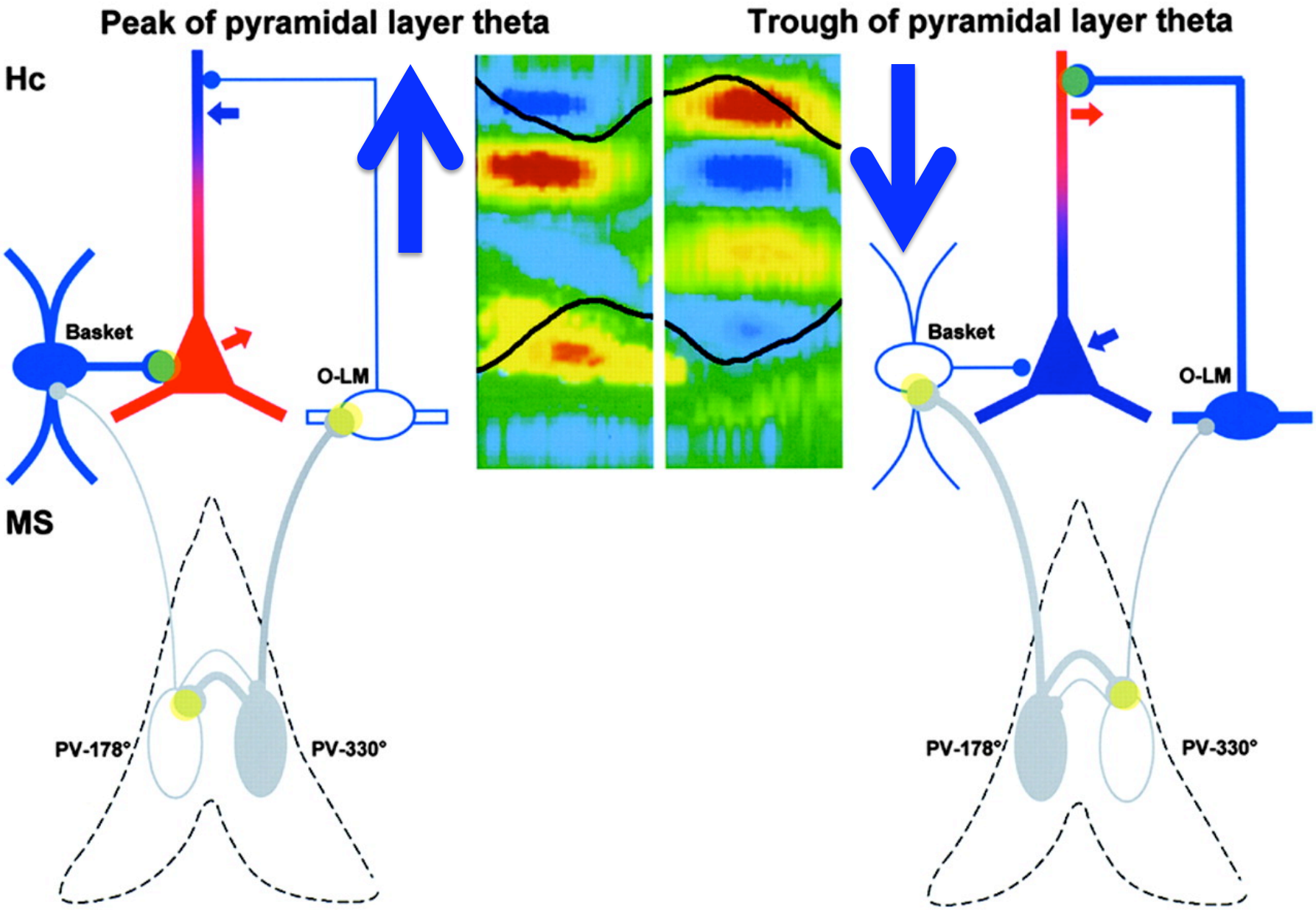


S. Makeig 2010

The generation and modulation of EEG / LFP is COMPLEX and not well understood

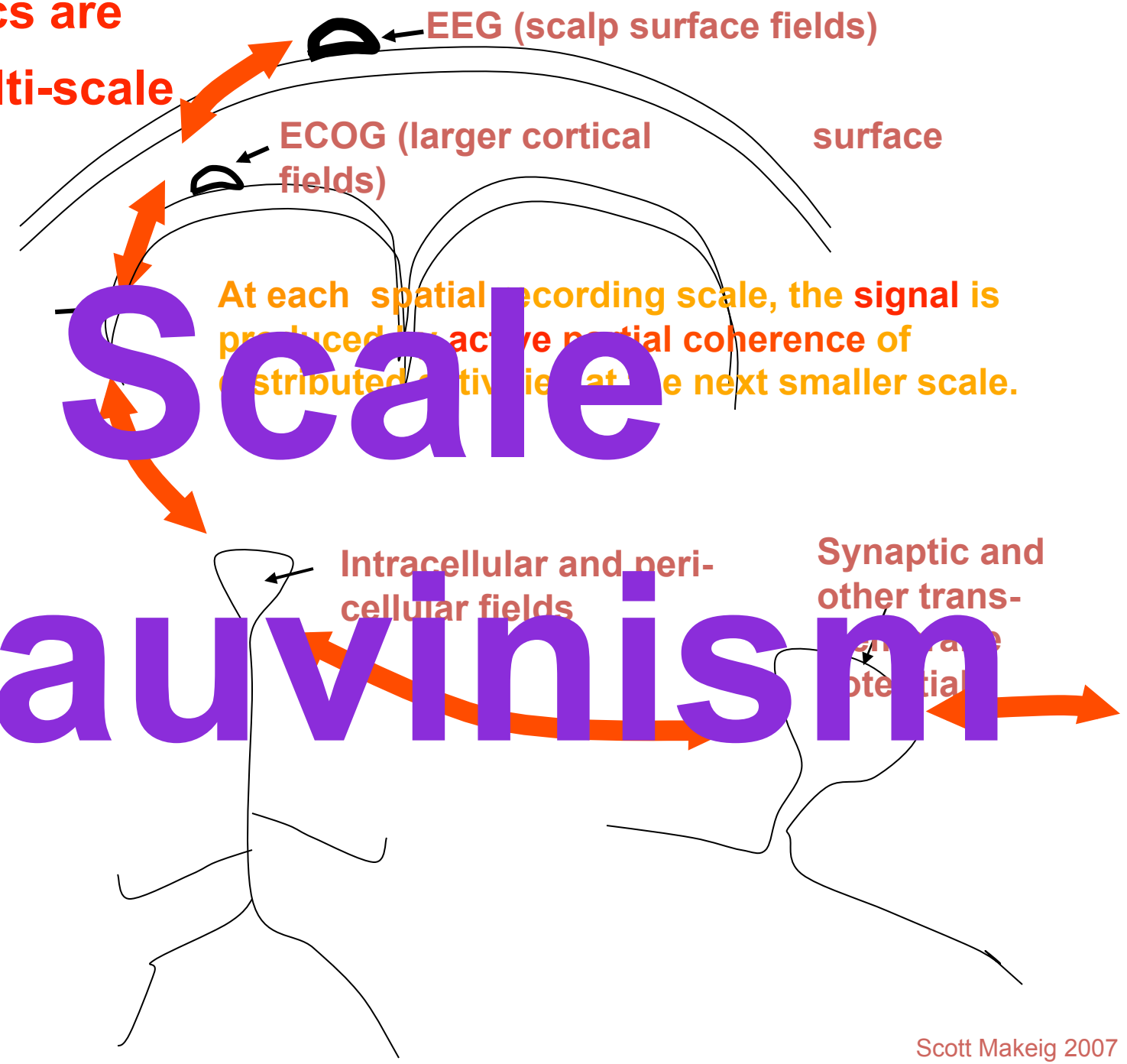


S. Makeig 2007



Borhegyi et al., JNS, 2004

Brain dynamics are inherently multi-scale

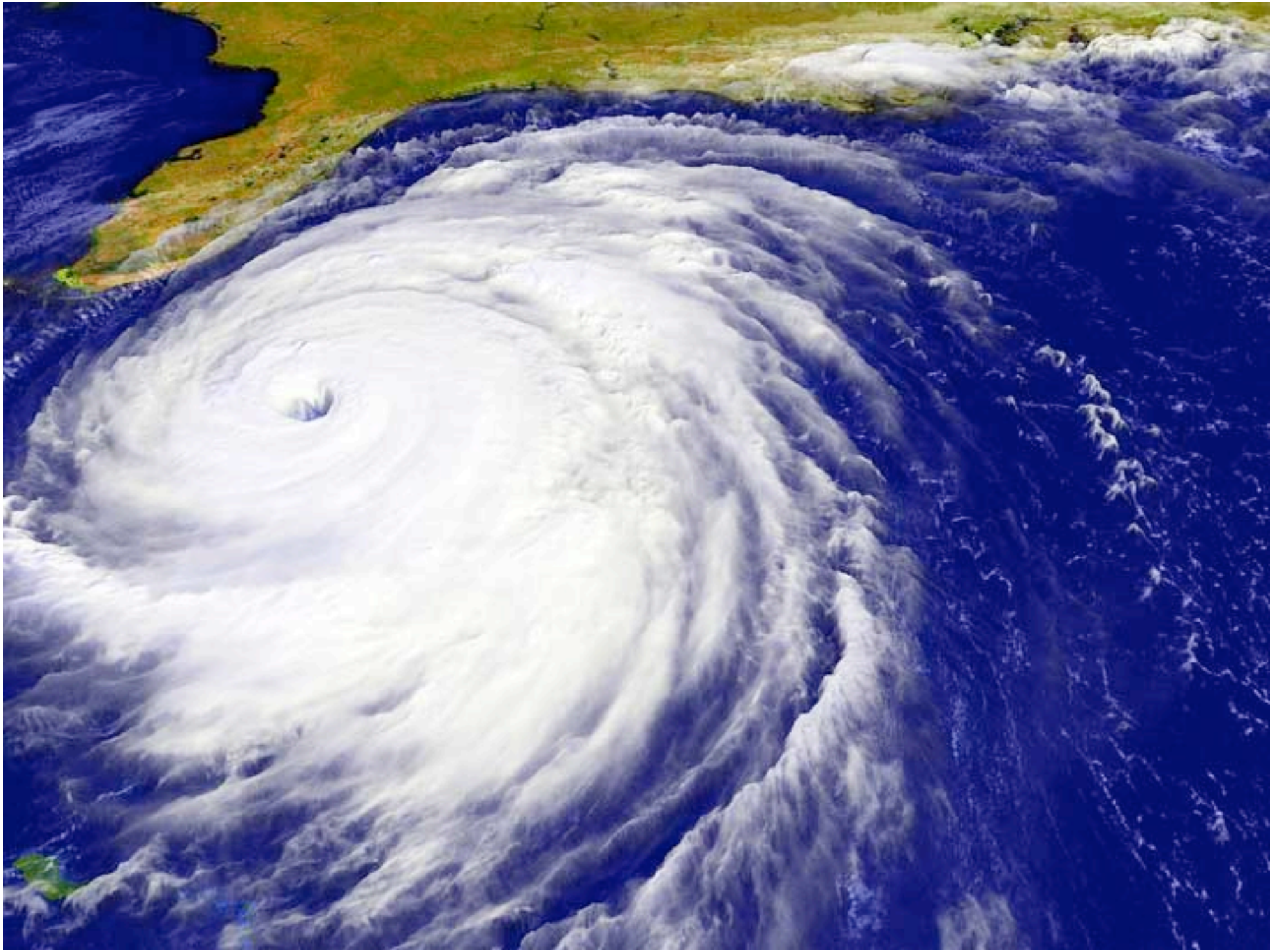


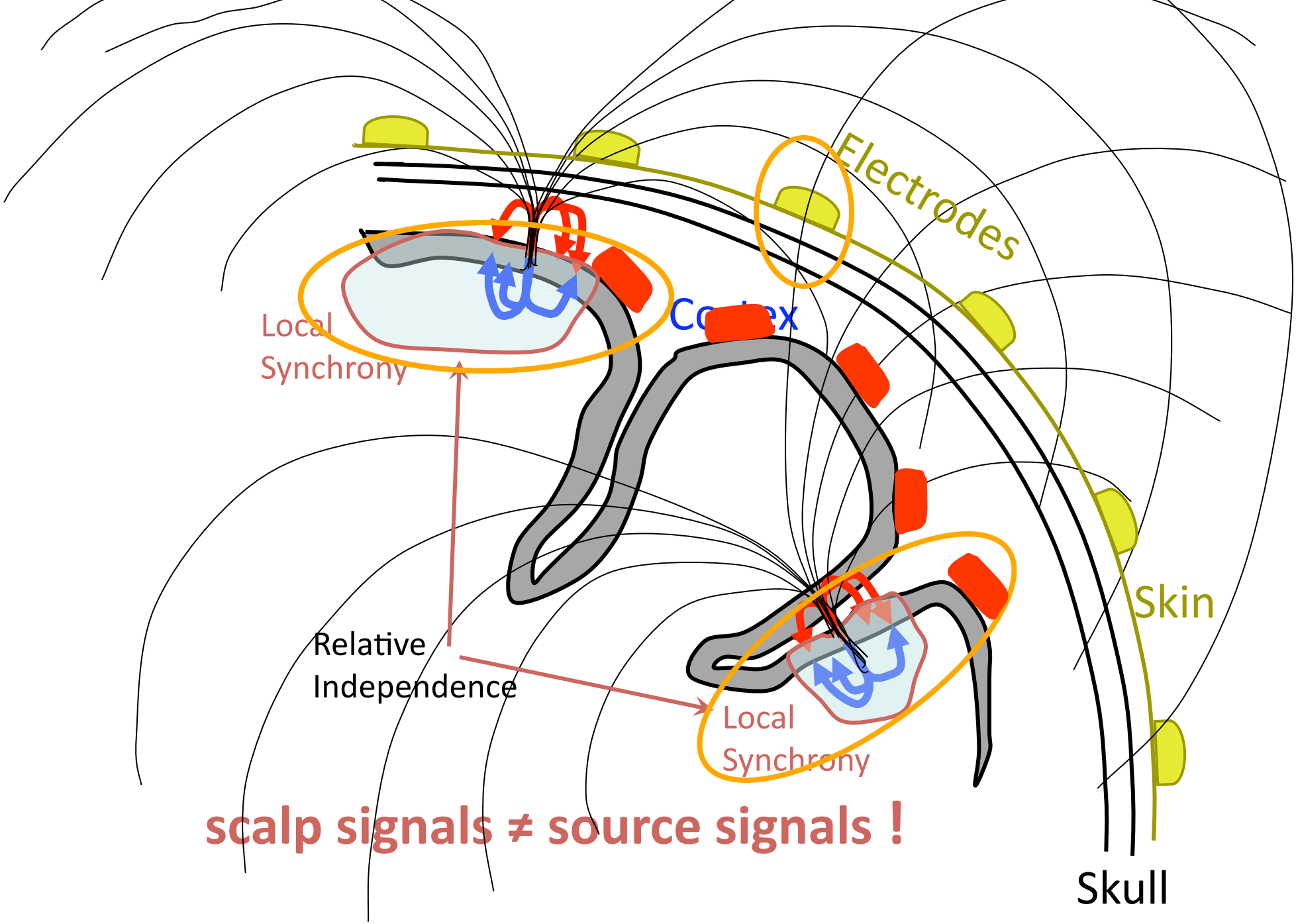
Scale chauvinism

Phase cones (Freeman)

Avalanches (Plenz)

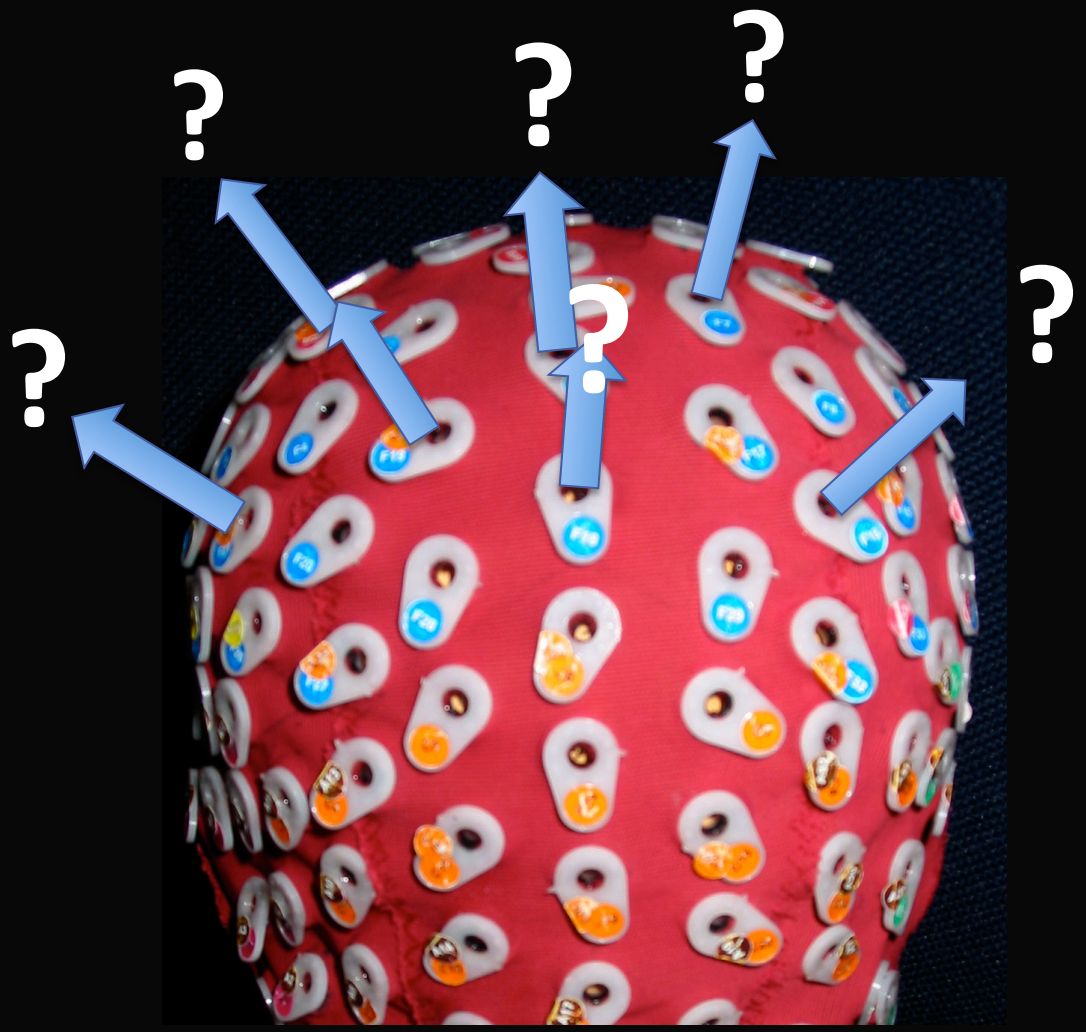
EEG source function ??





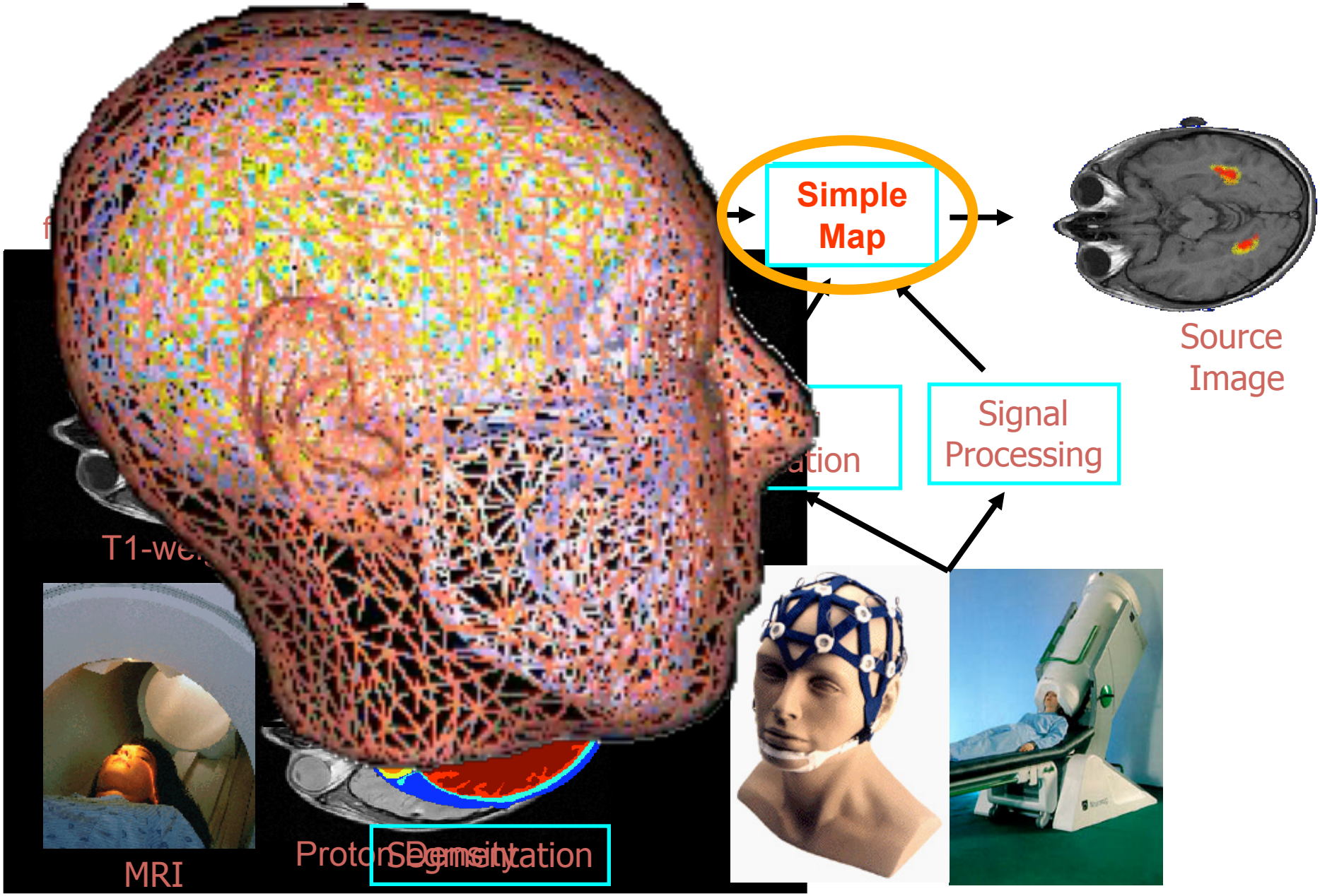
scalp signals ≠ source signals !

S. Makeig 2007

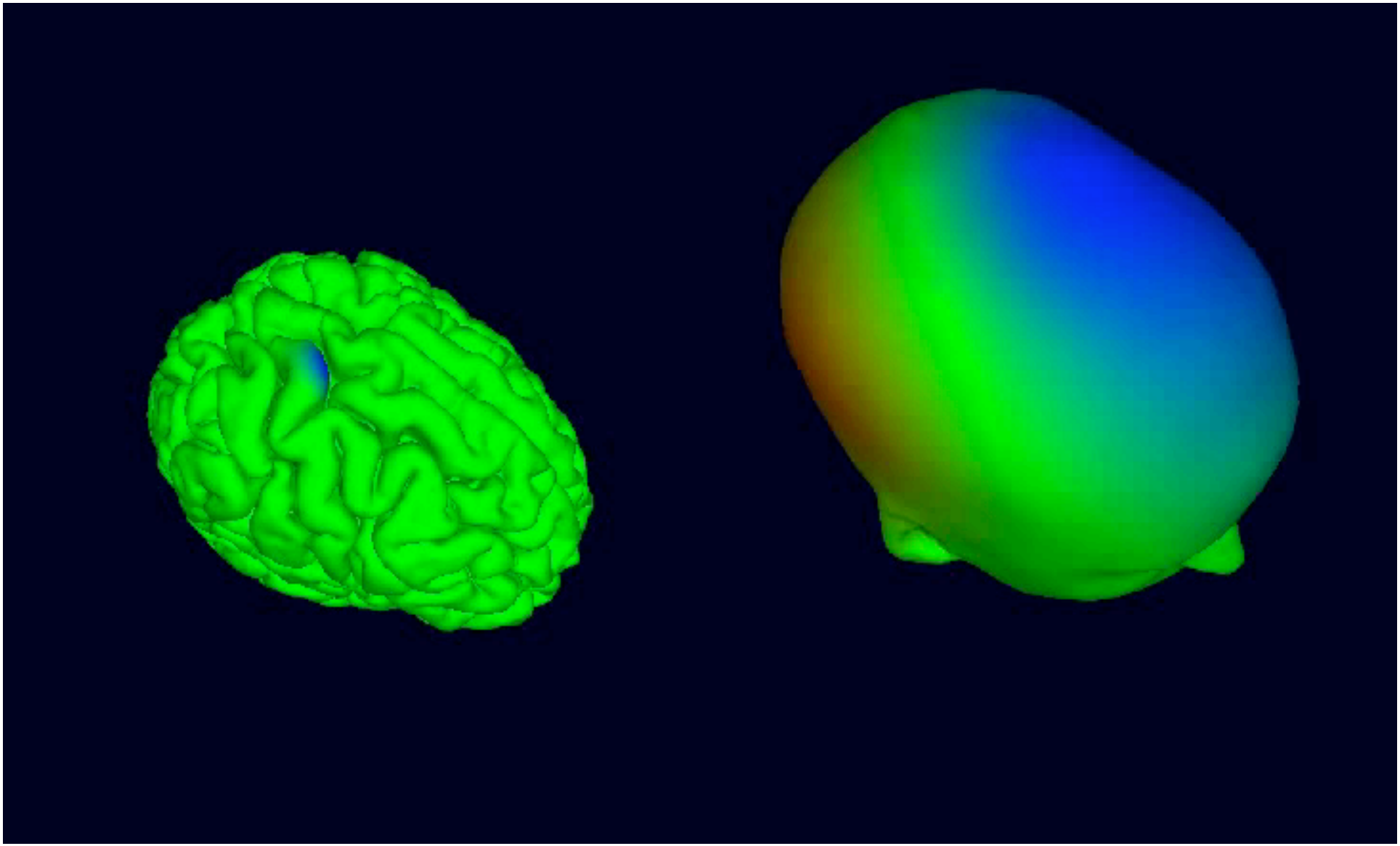


2-D Interpretation of Scalp EEG Signals ?

Electromagnetic source localization

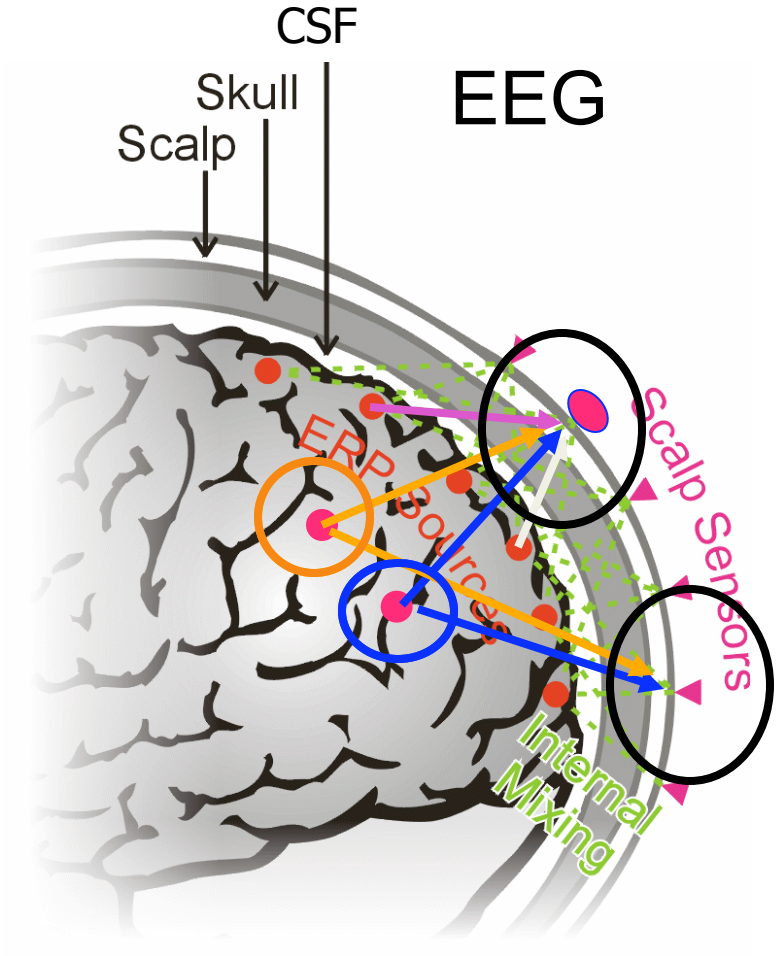


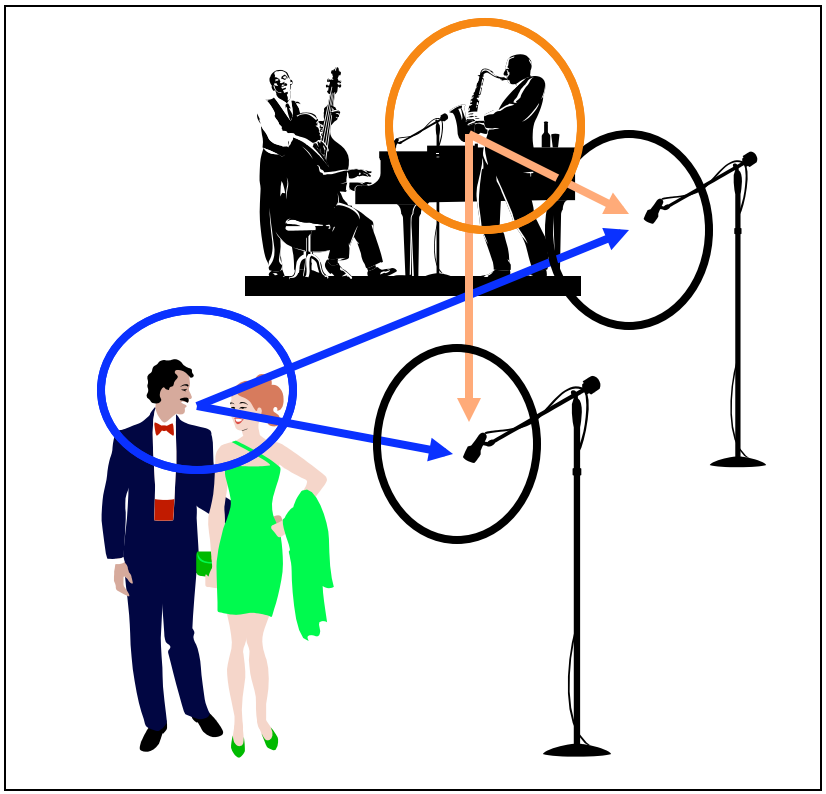
The very broad EEG point-spread function



Z. Akalin Acar & S. Makeig 2010

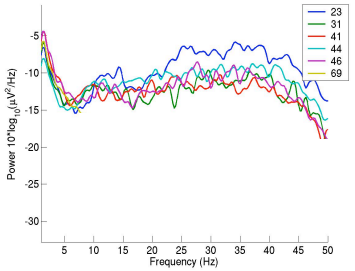
Blind EEG Source Separation by Independent Component Analysis

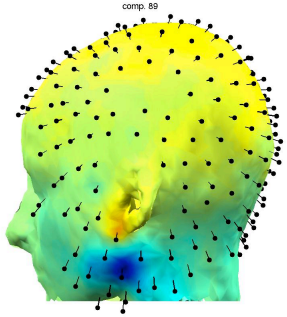


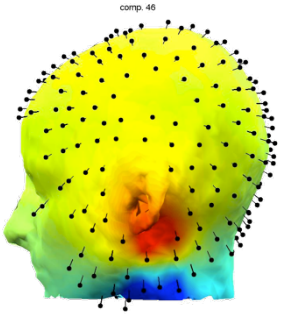


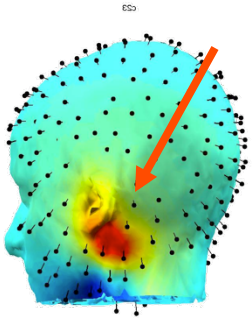
S. Makeig (2000)

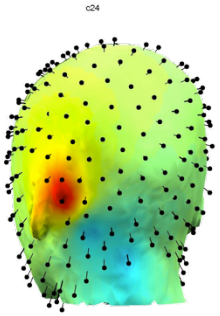
Independent muscle signals

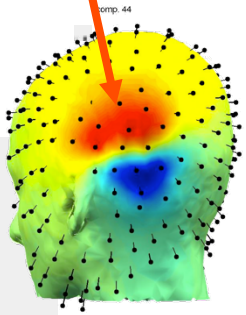


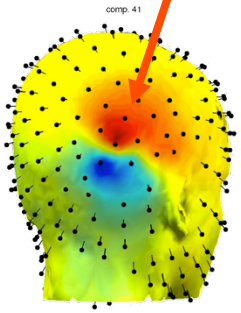


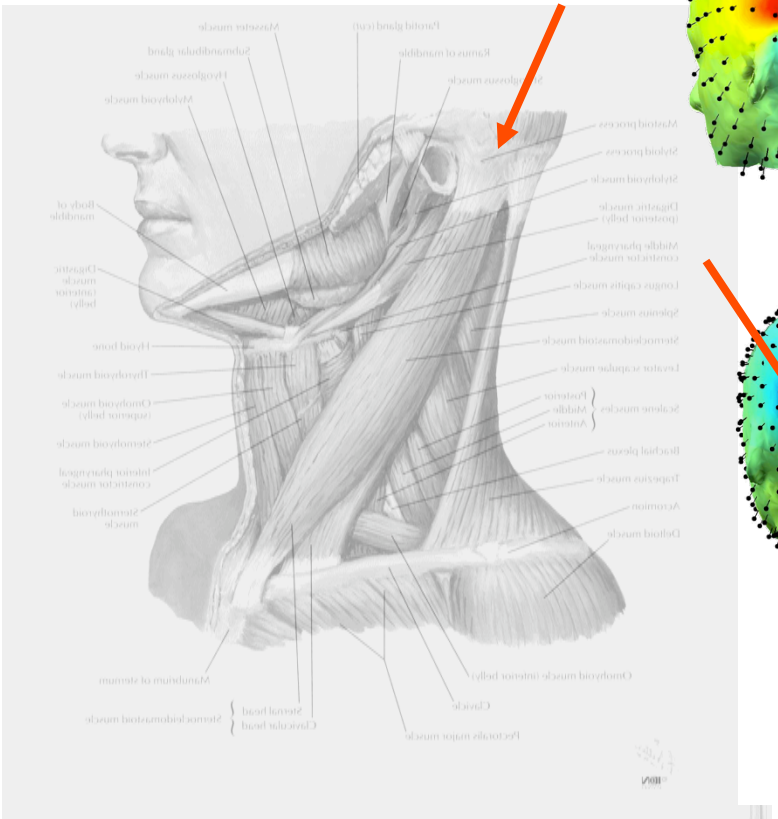


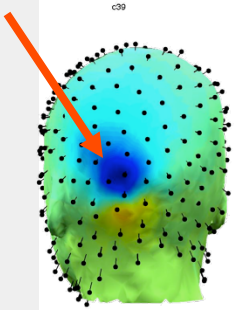


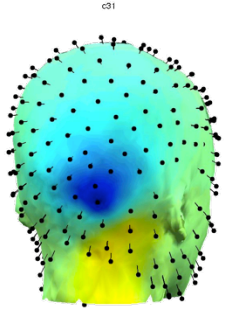


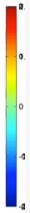


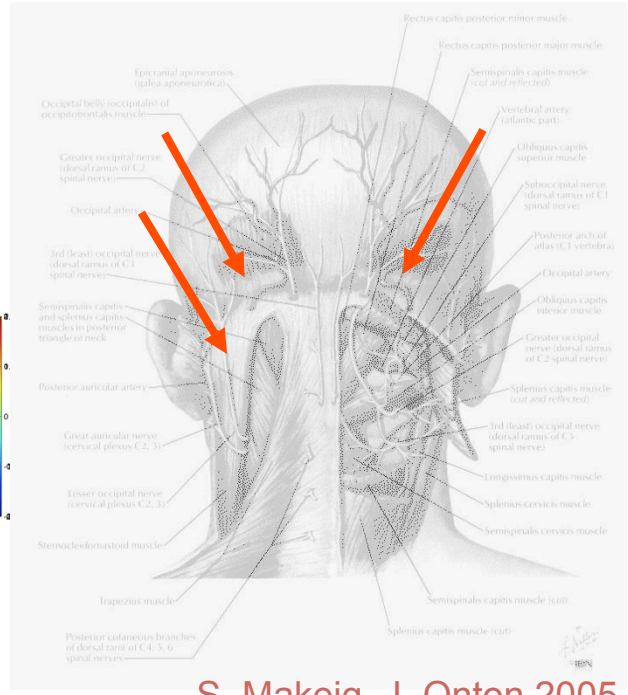






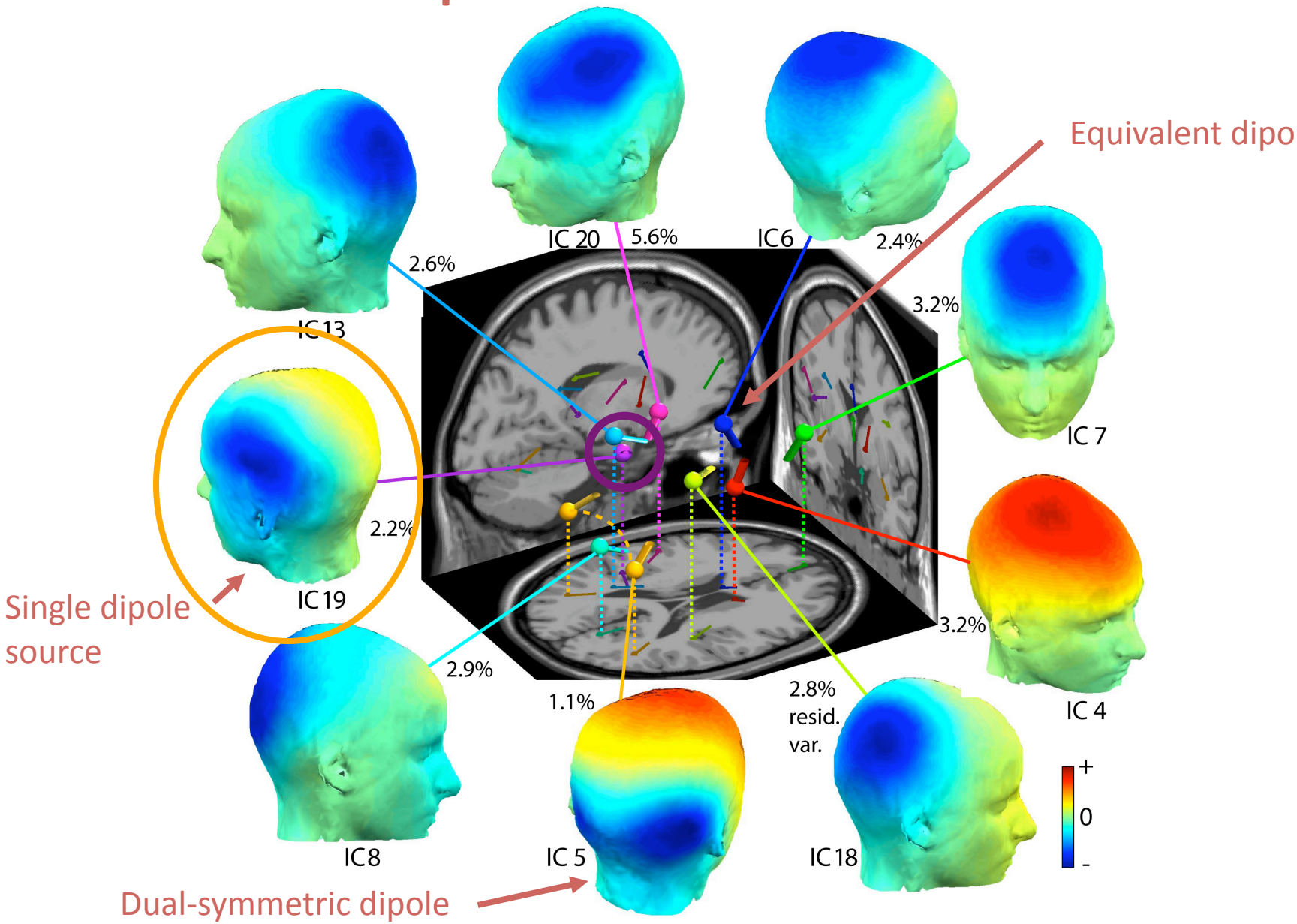






S. Makeig, J. Onton 2005

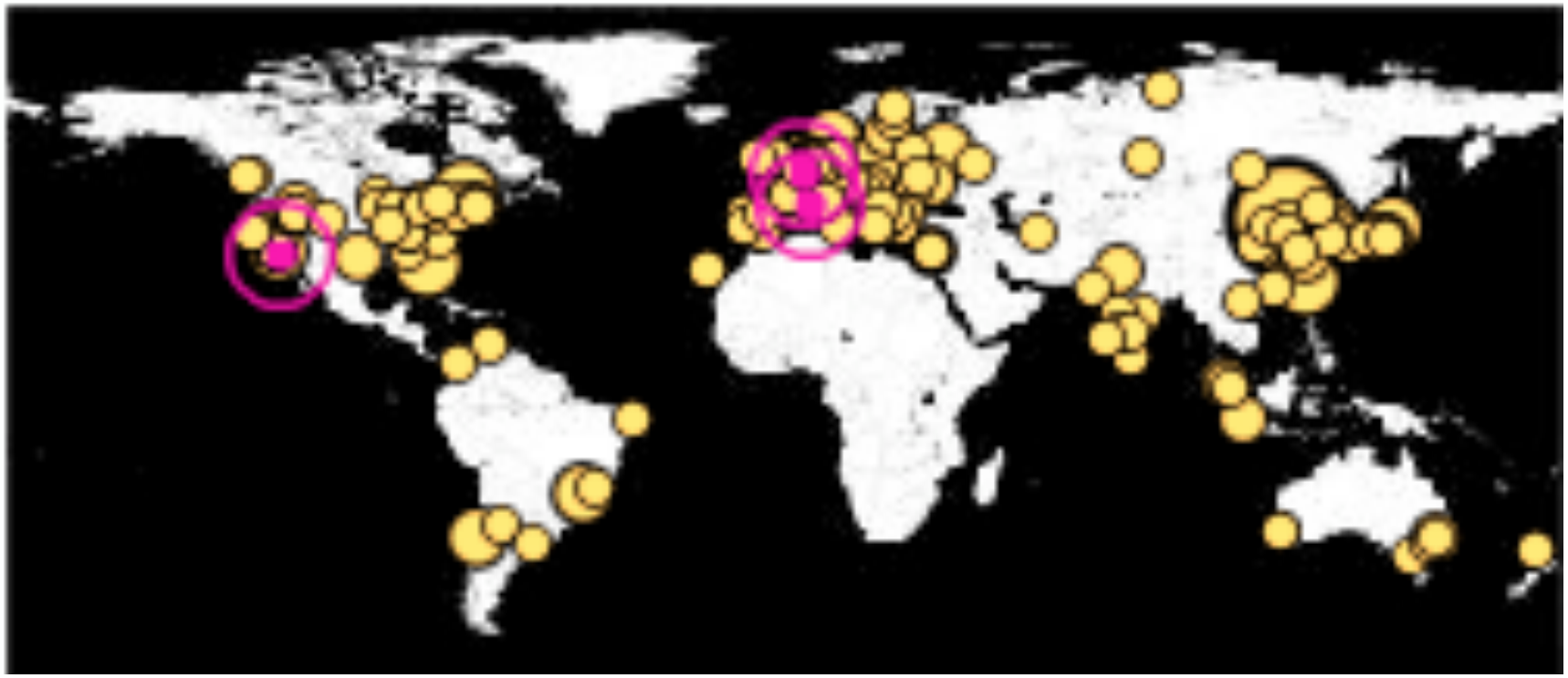
Compact cortical EEG sources



Julie Onton & S. Makeig (2006)

EEGLAB

An open-source signal processing environment for Matlab



http://sccn.ucsd.edu/eeglab

S. Makeig 2007