

From BigBrain to EEG/MEG source localization: alignment of neural generators with multimodal data

Jorge Bosch-Bayard⁽¹⁾, Deirel Paz-Linares⁽²⁻³⁾, Eduardo Aubert-Vazquez⁽²⁾, Eduardo Martinez-Montes⁽²⁾, Lidice Galan-Garcia⁽²⁾, Xindi Wang⁽¹⁾, Lindsay Lewis⁽¹⁾, Ariosky Areces-Gonzalez⁽²⁻³⁾, Jose E. Crespo-Baltar, Tania Perez-Ramirez⁽²⁾, Claude Lepage⁽¹⁾, PJ Toussaint⁽¹⁾, Alan C. Evans⁽¹⁾, Pedro Valdes-Sosa⁽²⁻³⁾

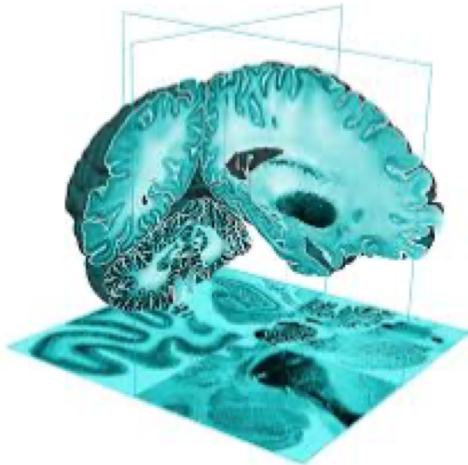
(1) McGill Centre for Integrative Neuroscience (MCIN), Ludmer Centre for Neuroinformatics and Mental Health, Montreal Neurological Institute (MNI), McGill University, Montreal, Canada

(2) Cuban Neuroscience Center

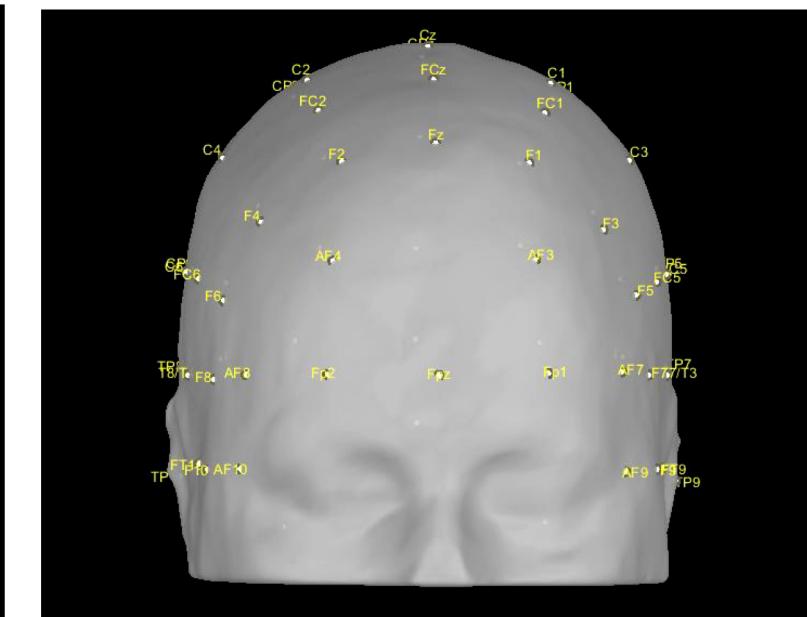
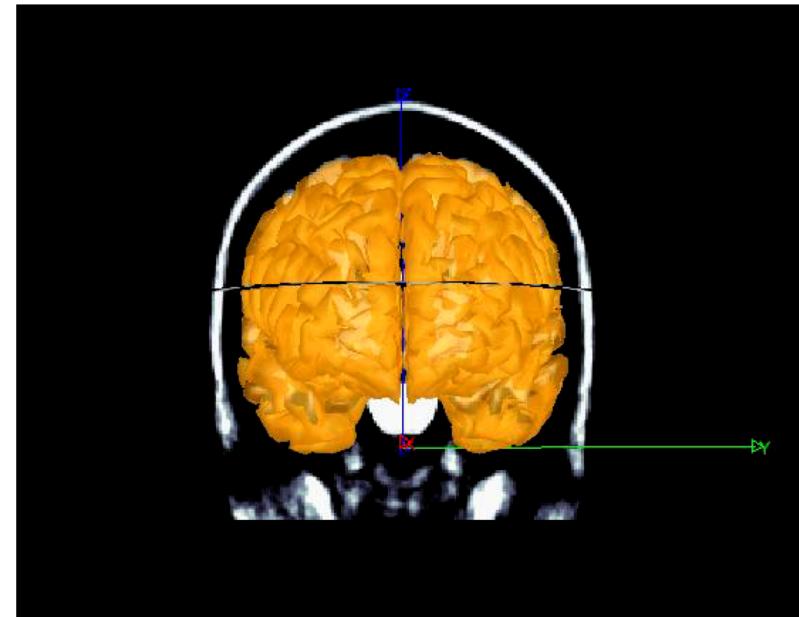
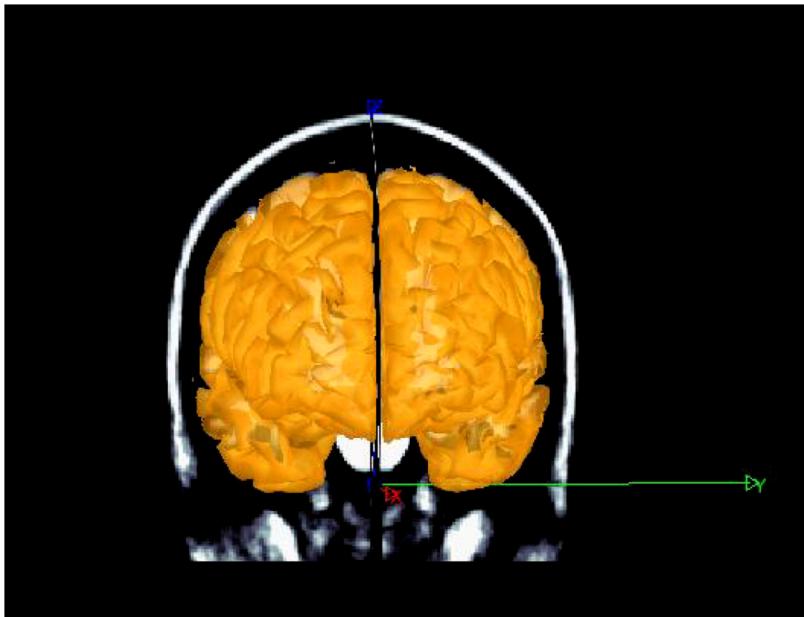
(3) The Clinical Hospital of Chengdu Brain Sciences Institute, University of Electronic Science and Technology of China UESTC, Chengdu, China

Electrophysiology with Big Brain

Hybrid image created by Aubert with the ICBM template.
Needed for segmentations of scalp and skull for Lead Field calculations

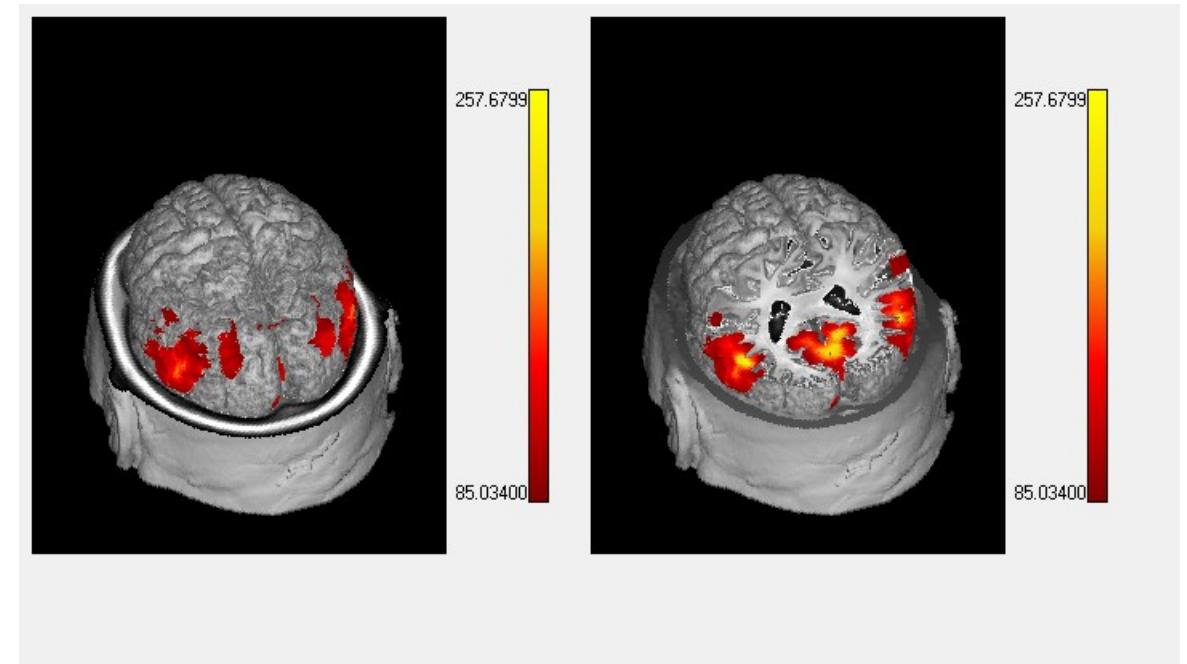
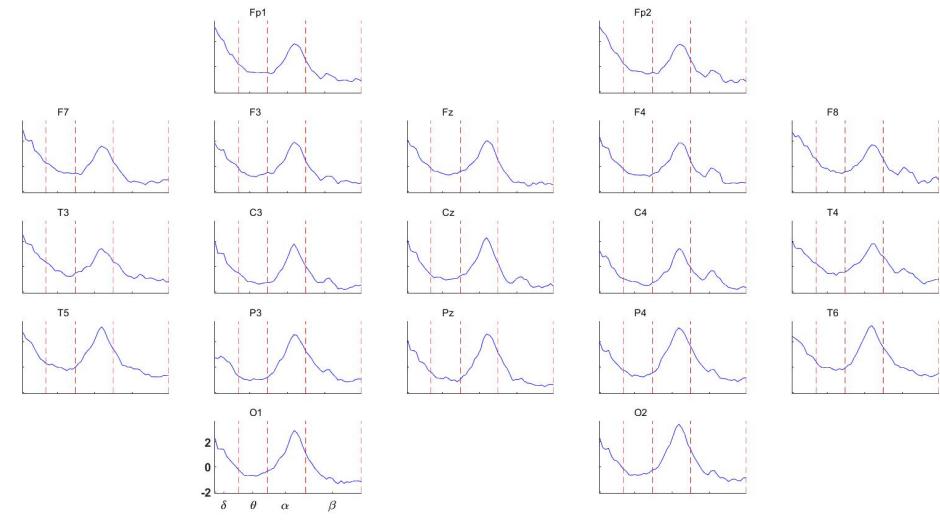
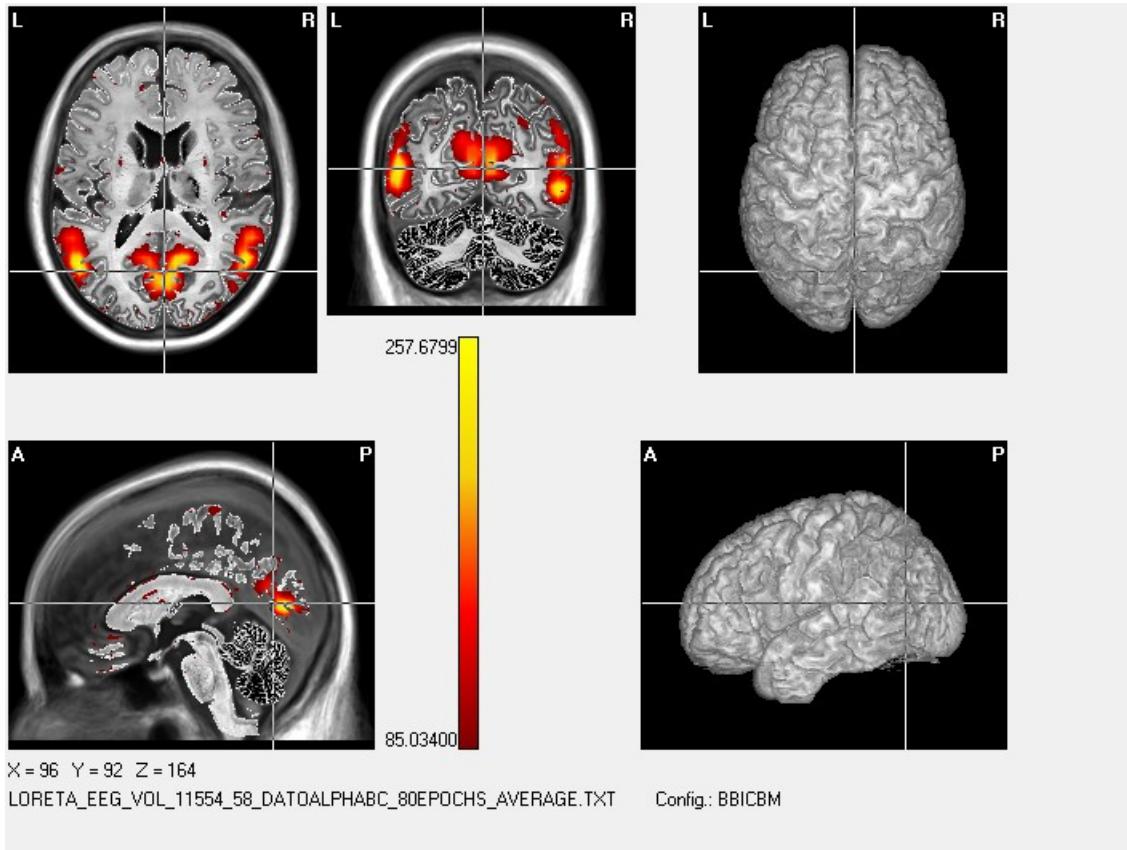


Electrophysiology with Big Brain



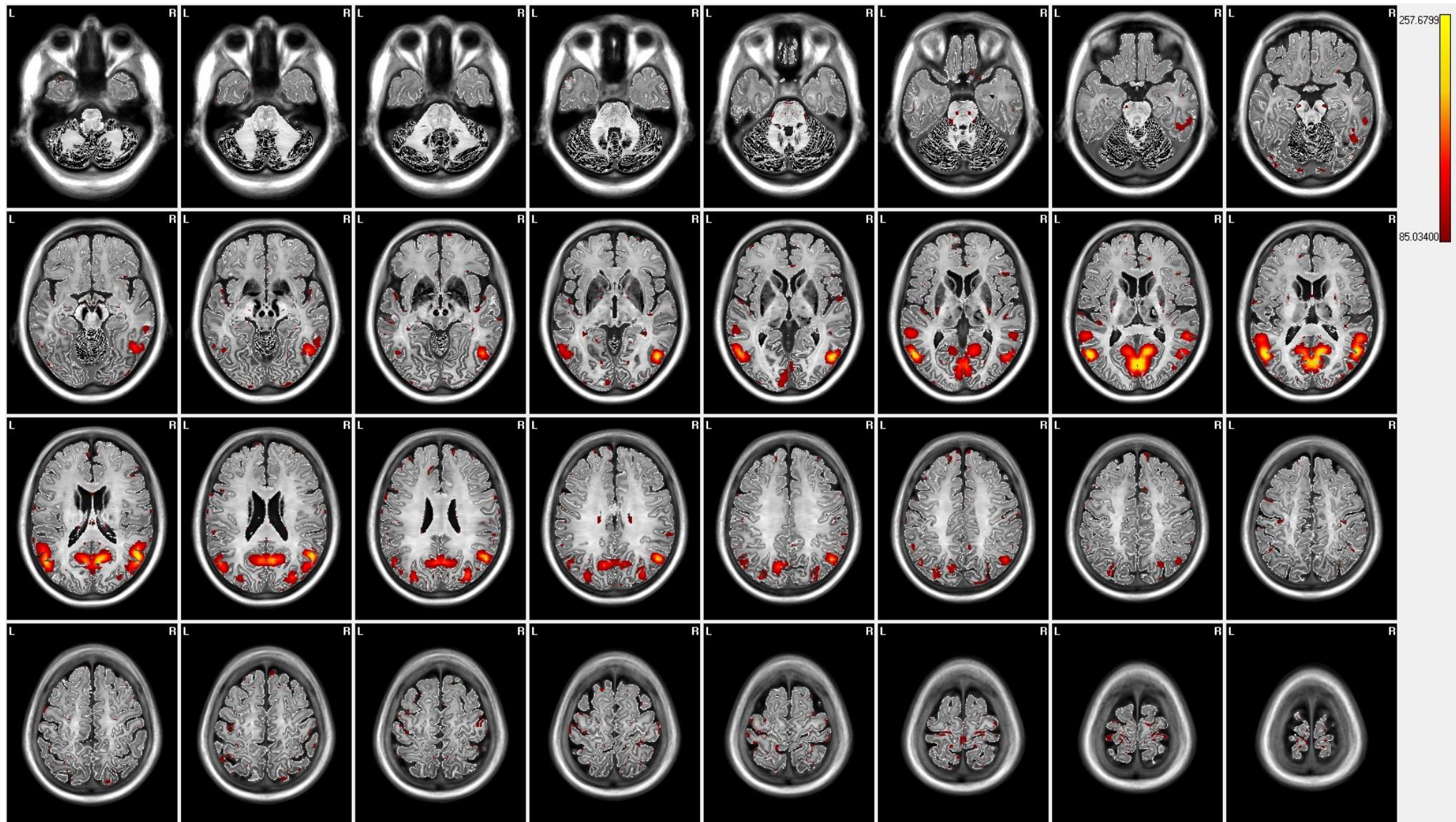
Electrophysiology with Big Brain

Volumetric LORETA solution over Big Brain for the Alpha peak of a healthy subject from the Cuban Human Brain Mapping



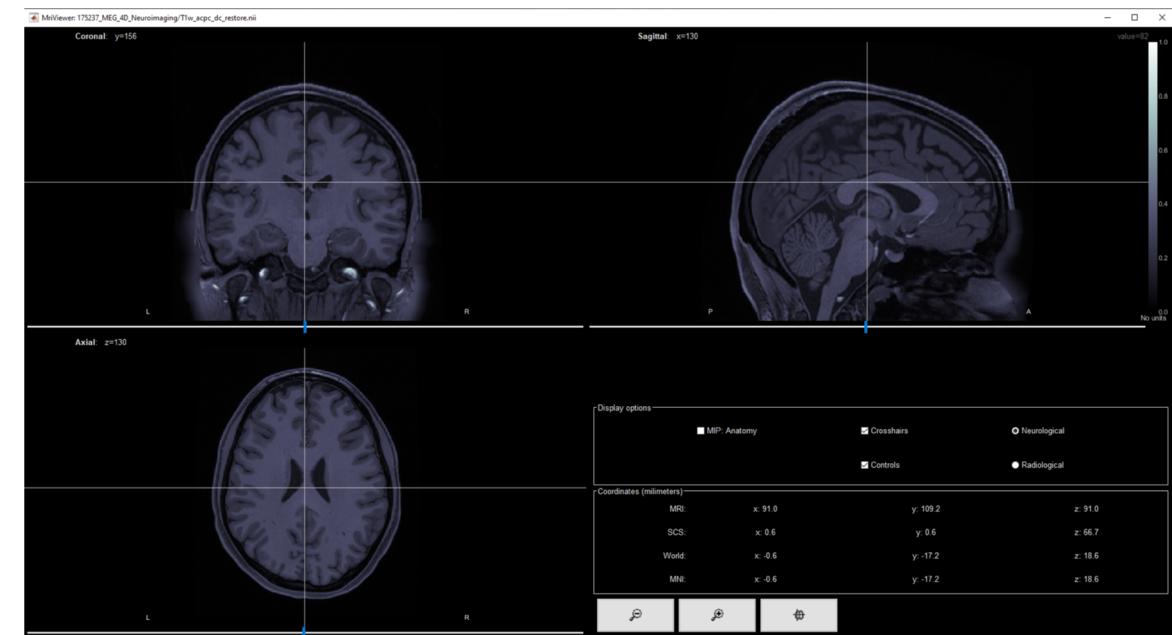
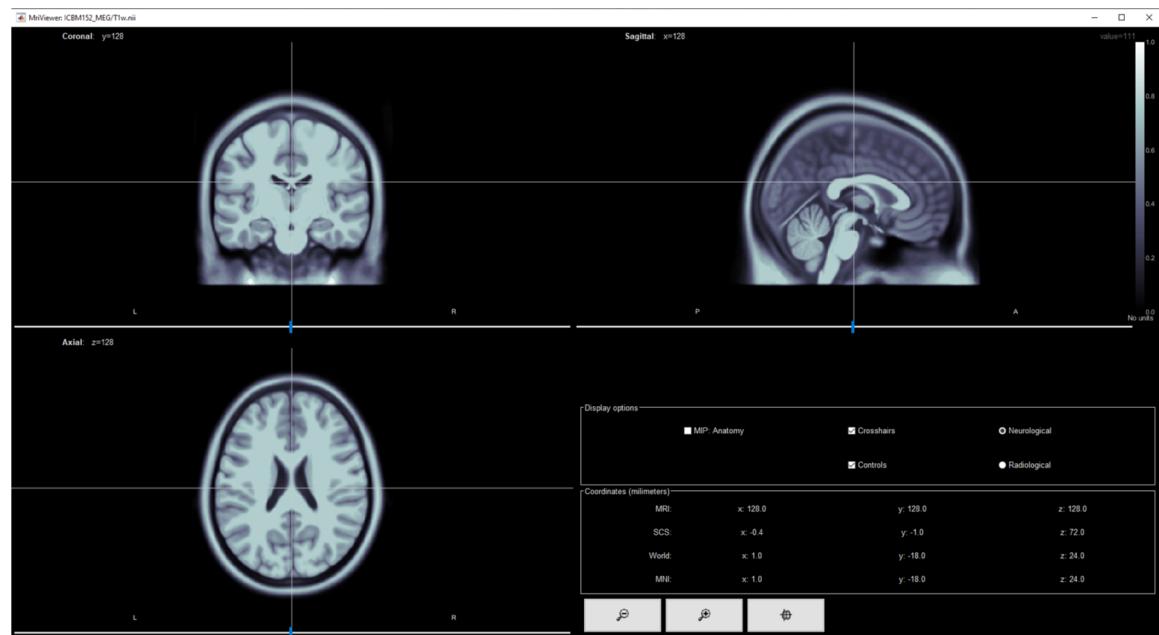
Electrophysiology with Big Brain

A collage of different slices for the same solution previously shown

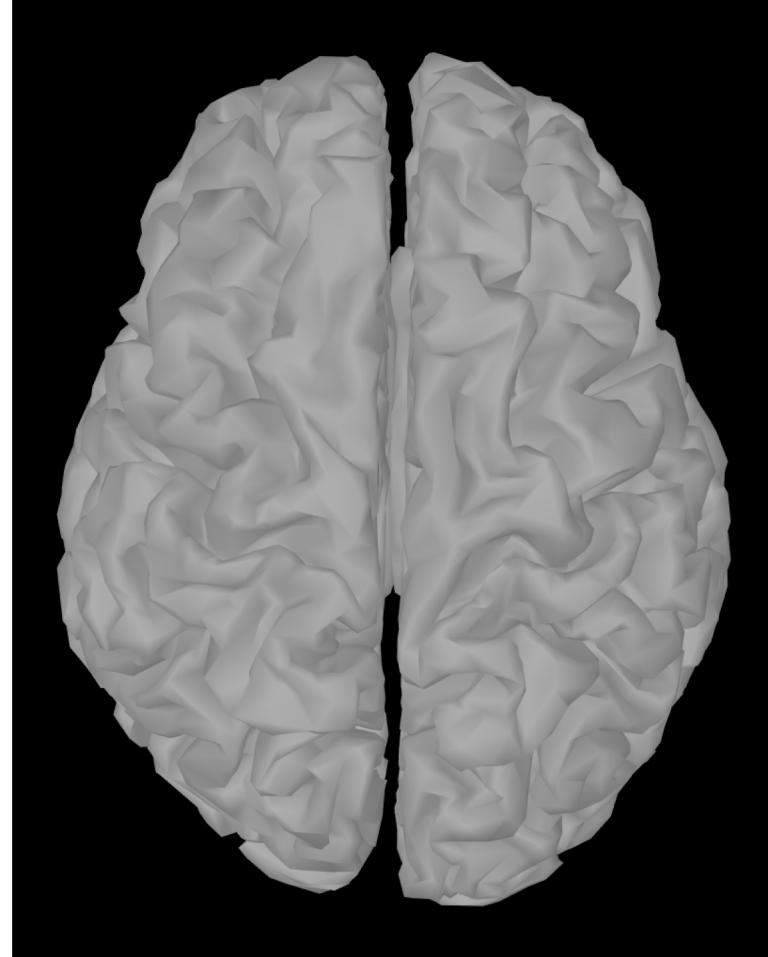


Construction of a Big Brain MEEG Head Model Template

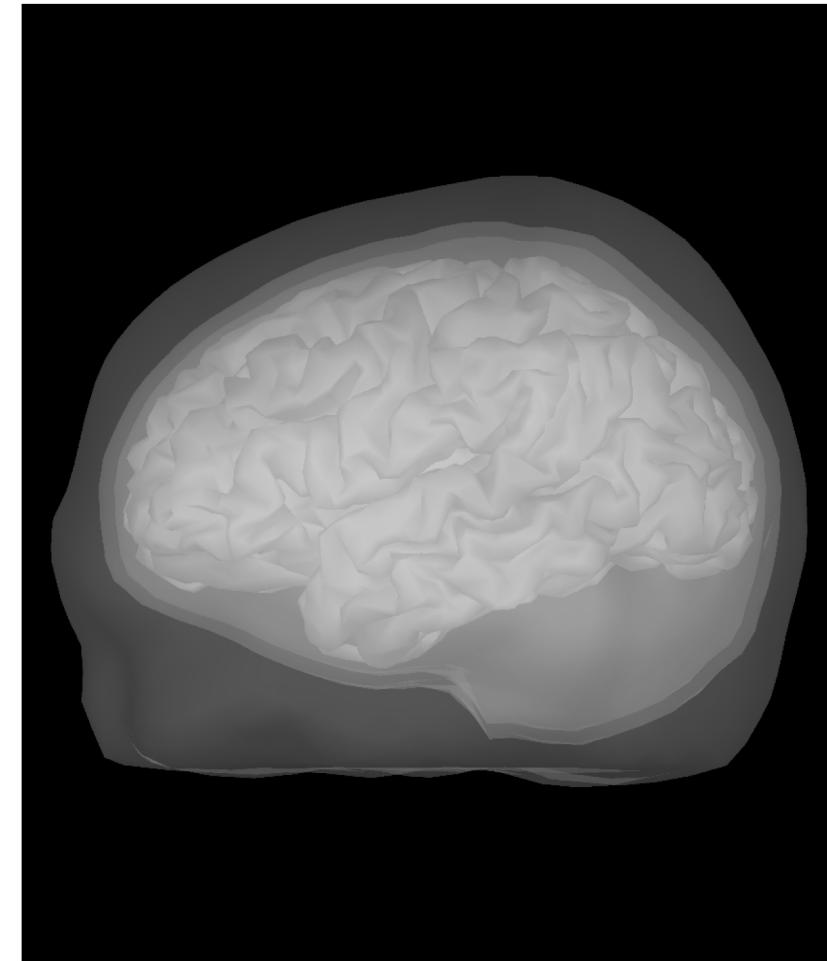
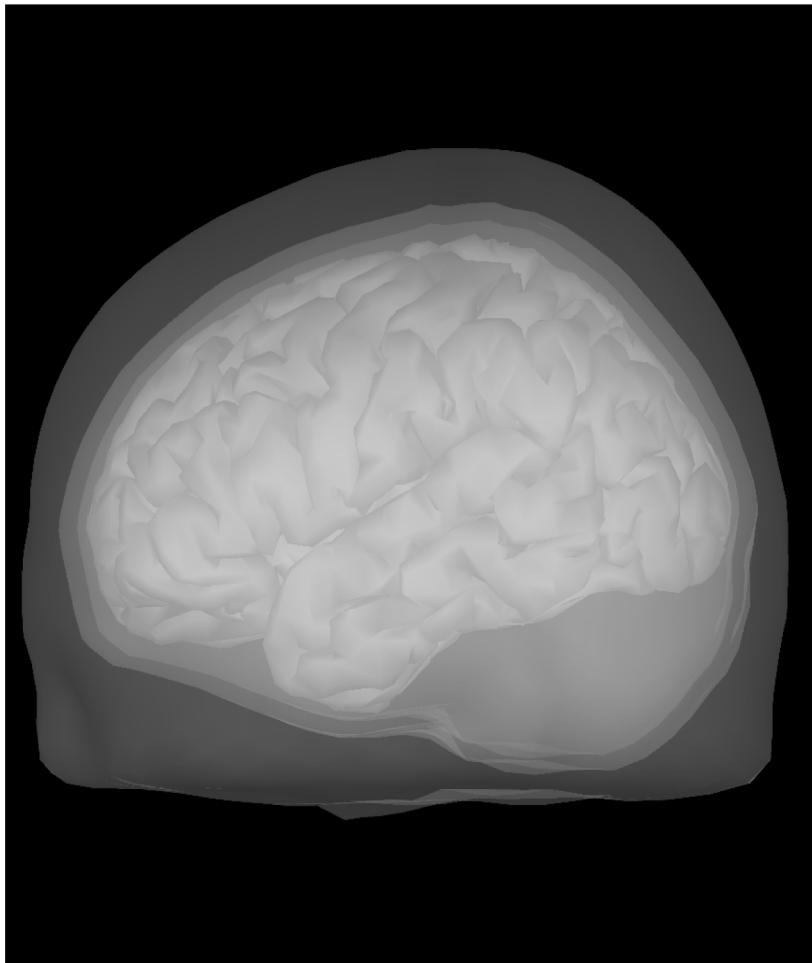
T1 BigBrain-ICBM vs HCP subject 175237 (s175237)



Cortex BigBrain-ICBM vs HCP s175237

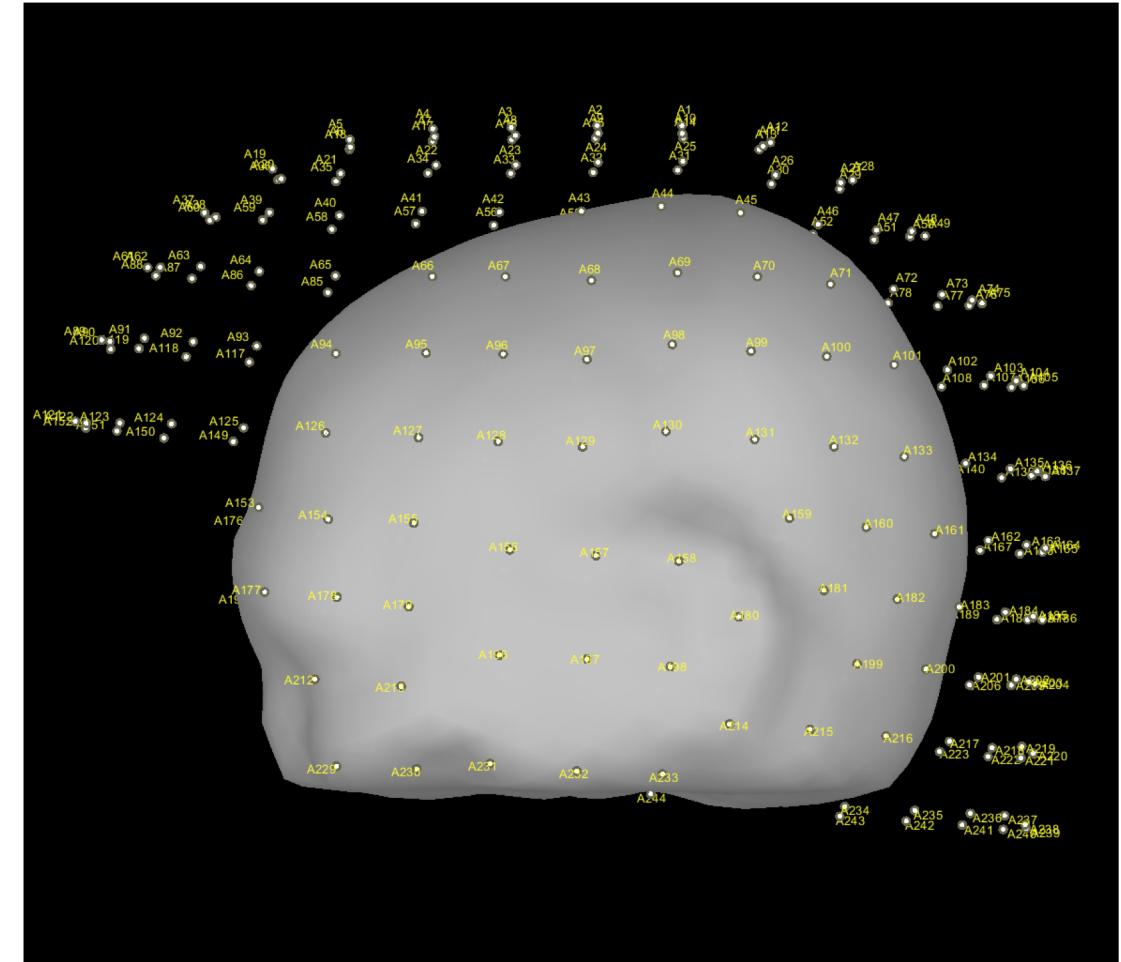
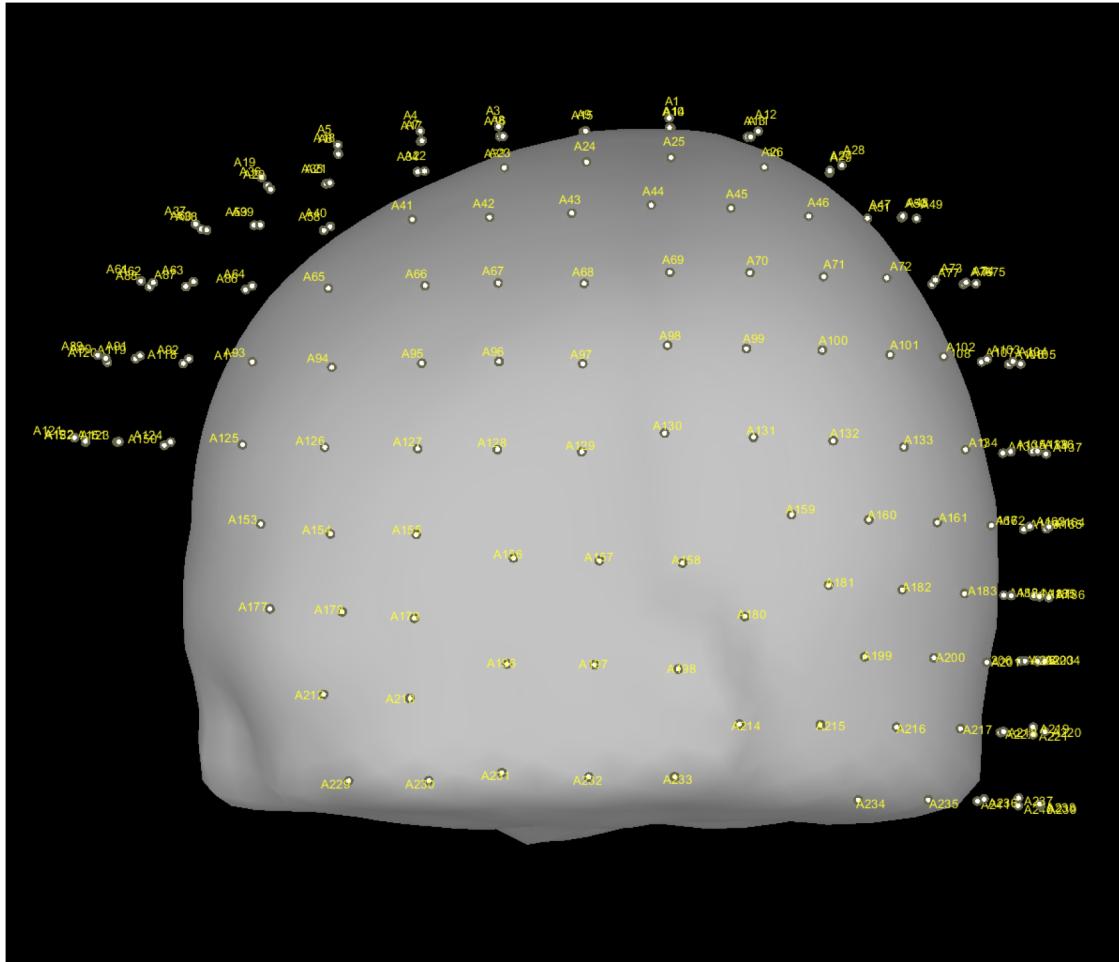


BigBrain-ICBM vs HCP s175237 Head models

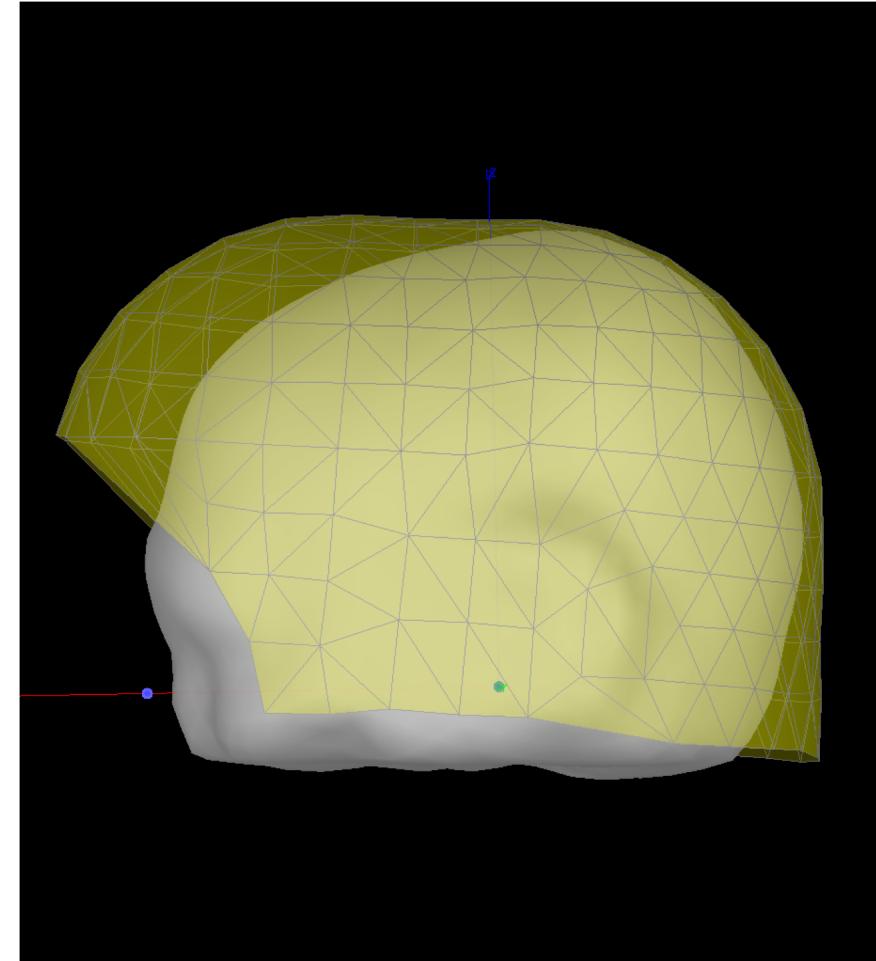
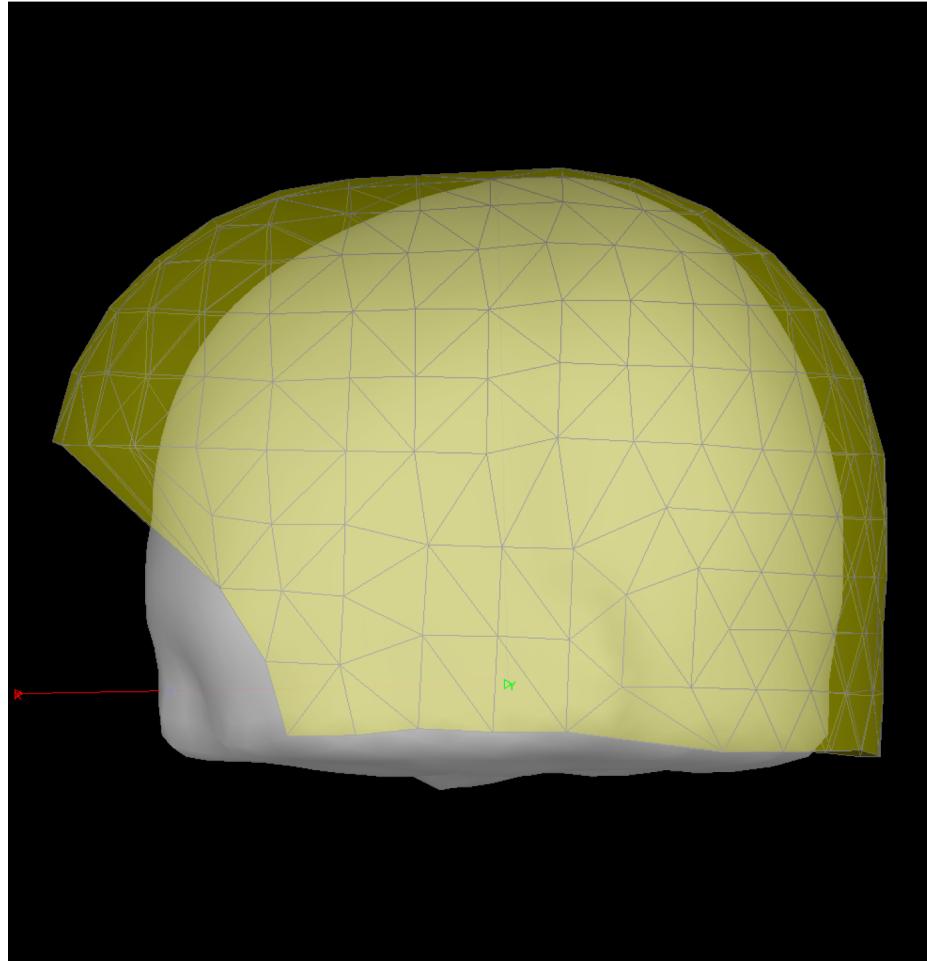


Sensors location BigBrain-ICBM vs HCP s175237

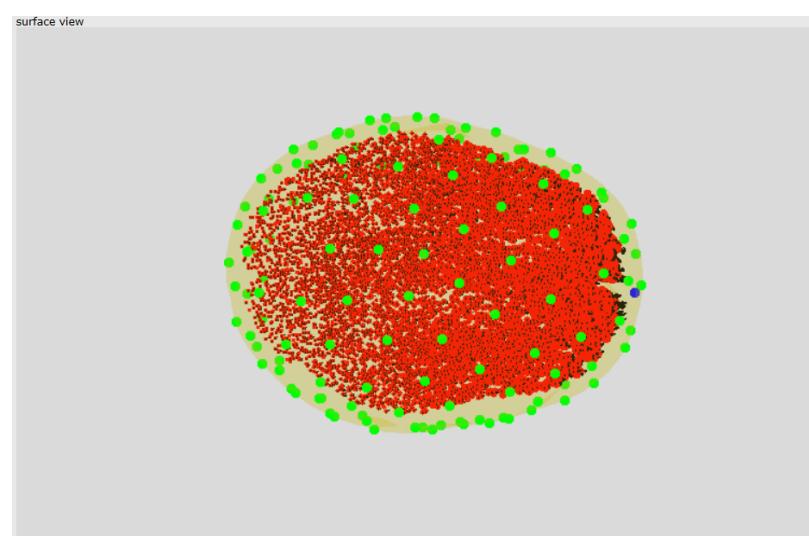
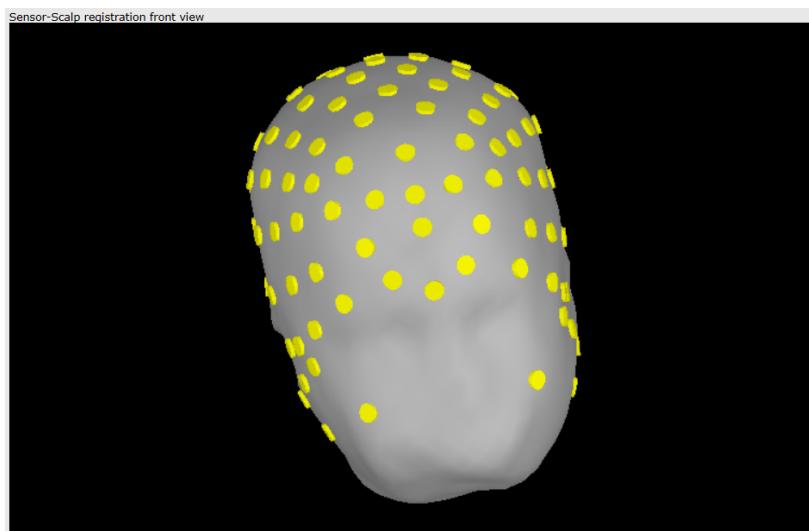
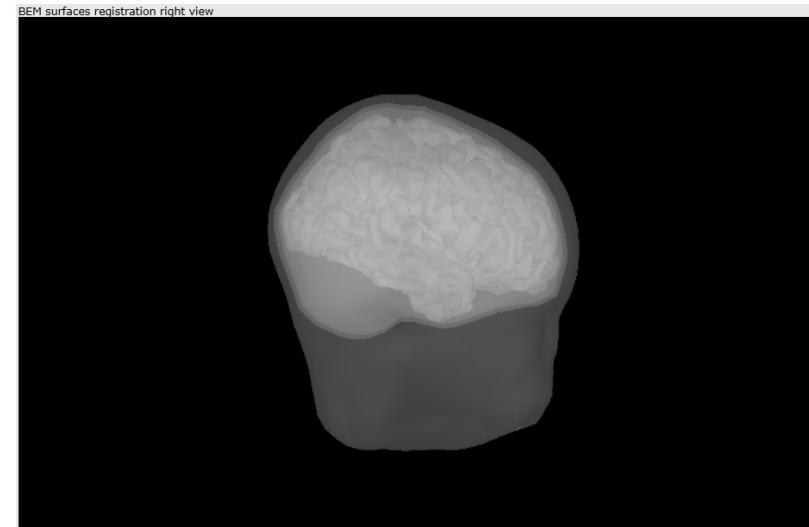
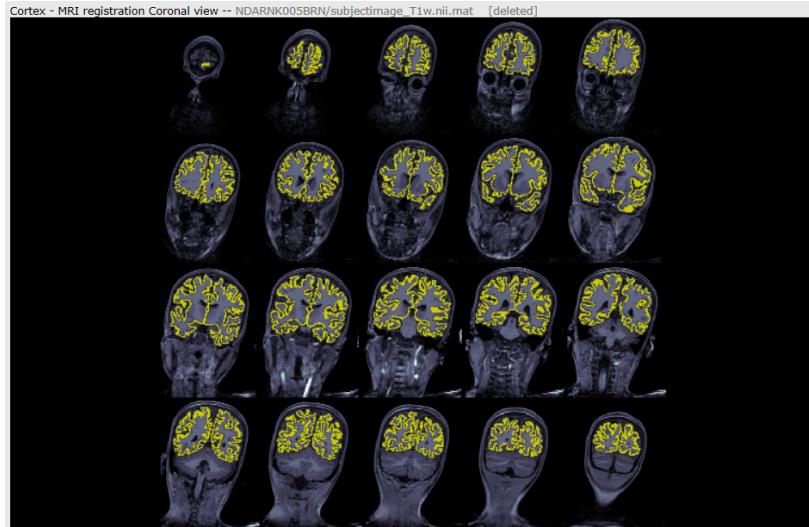
247 coils



MEG helmet for BigBrain-ICBM vs HCP s175237 inner surface registration

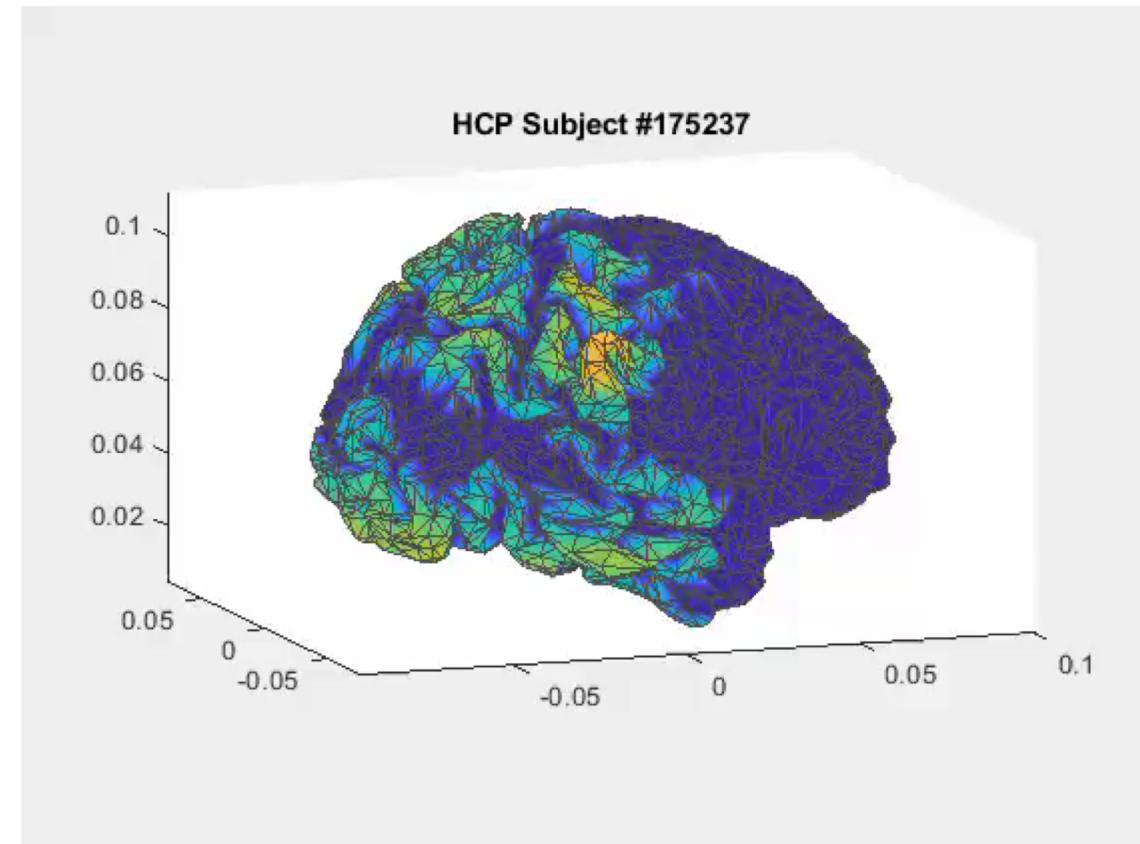
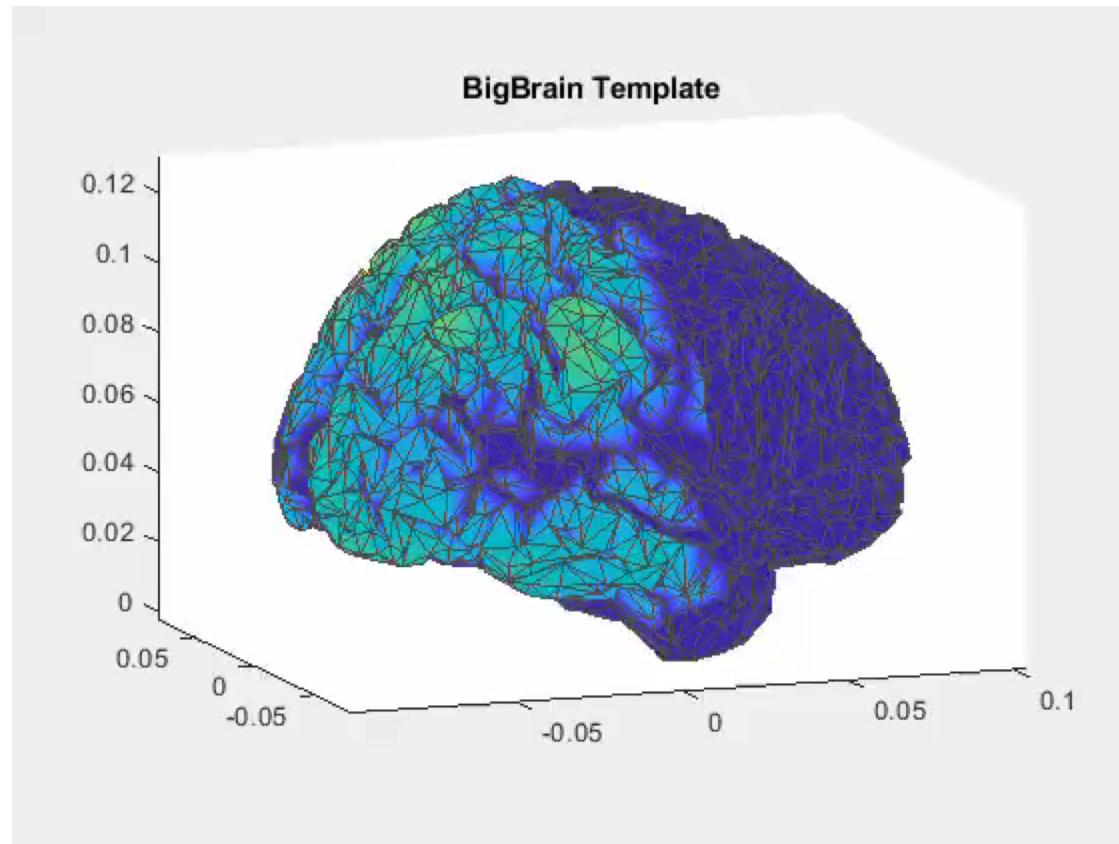


Example of Report for Visual Quality Control



Big Brain-ICBM vs HCP s175237

Source localization using BC-VARETA



Electrophysiology with Big Brain: First Round

Next steps will be:

1. To develop a qEEGt-Big Brain version, for different head models.
2. To develop new EEG multinational norms (USA, Zwitzerland, Cuba, Mexico, Barbados) for the qEEGt-Big Brain.
3. To dockerize it in CBRAIN.
4. To use CBRAIN high definition to create improved models for EEG electrophysiology.