



# Investigating the feasibility of helium OPM MEG in Amiens

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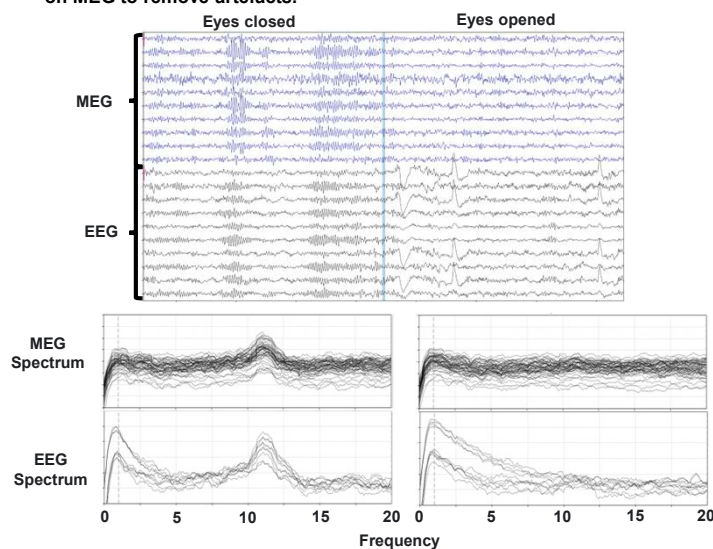
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## 1 Introduction

- Magnetoencephalography (MEG) is a non-invasive technique that measures weak magnetic fields generated by brain's electrical currents, offering temporal resolution comparable to electroencephalography (EEG).
- Optical pump magnetometers (OPMs) are a type of MEG system that utilize lasers instead of supra-conducting quantum interference devices (SQUIDS). OPMs operate at room temperature, enabling direct placement on the scalp for closer proximity to the brain.

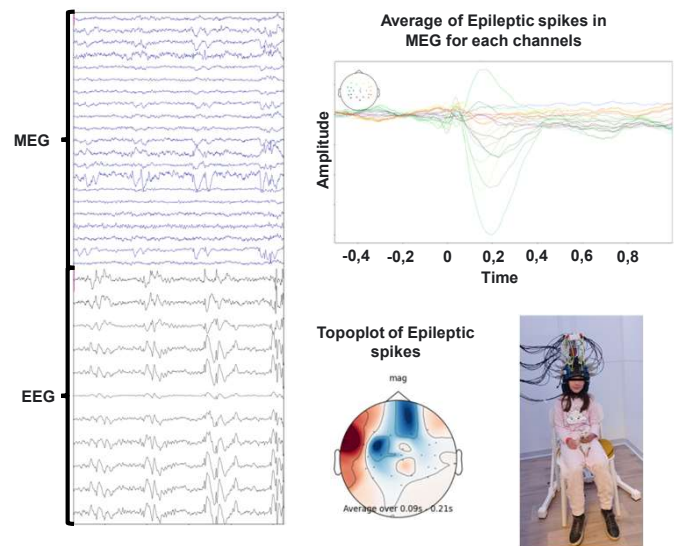
## 2 Looking into Alpha band

- Two healthy adults were recorded in simultaneous EEG/MEG during alternating eyes-open/eyes-closed periods.
- EEG and MEG signals were filtered between 1 and 20 Hz. ICA was applied on MEG to remove artefacts.



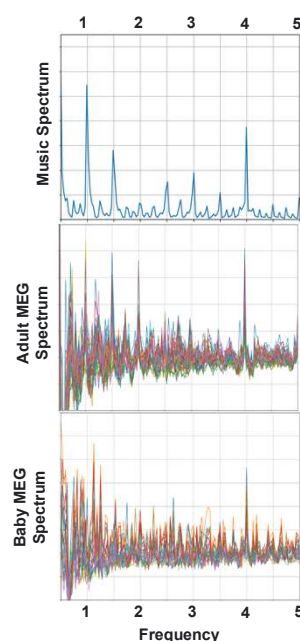
## 3 Looking into Epilepsy

- Two infants were recorded in EEG and MEG during 20 minutes.
- EEG and MEG signals were filtered between 0,5 and 30 Hz. ICA was applied on MEG to remove artefacts.



## 4 Looking into Music perception

- Eight adults and one 3-days baby were recorded in MEG. They listened to 5 different 32s musics randomly repeated 10 times.
- MEG signal was filtered between 0,5 and 20 Hz. ICA was applied to remove artefacts.
- 32 sec epochs were created and the ones with remaining artefacts were removed. Epochs were averaged.
- FFT was calculated for each channel and each subject then normalized. FFT was averaged over subjects for the adult population.

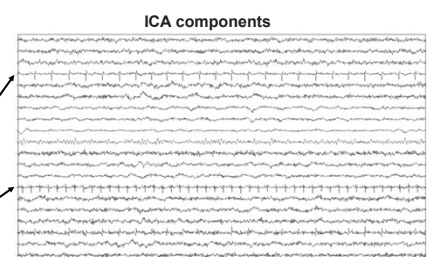
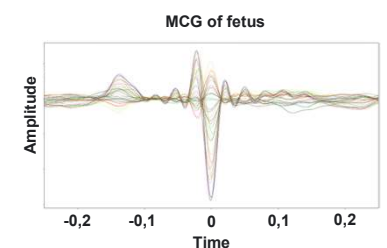


## 5 Looking into Fetus

- One fetus was recorded in MEG during 20 minutes.
- MEG signal was filtered between 0,5 and 30 Hz. ICA was applied to detect cardiac activity of fetus.
- QRS were detected on the ICA components
- Epochs were created on filtered MEG signals, then averaged.



Cardiac activity of the mother  
Cardiac activity of the fetus



## 6 Contact

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