

SIM4LIFE/YOON-SUN ARM STIMULATION

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實驗觀念

使用 S4Lite 中的耦合電磁學 (EM) 和神經元動力學模擬來研究電子藥物和生物電子醫學背景下的神經刺激相關量。電極對的簡化模型提供電刺激，最終在右臂模型的神經軌跡中引發神經電反應。

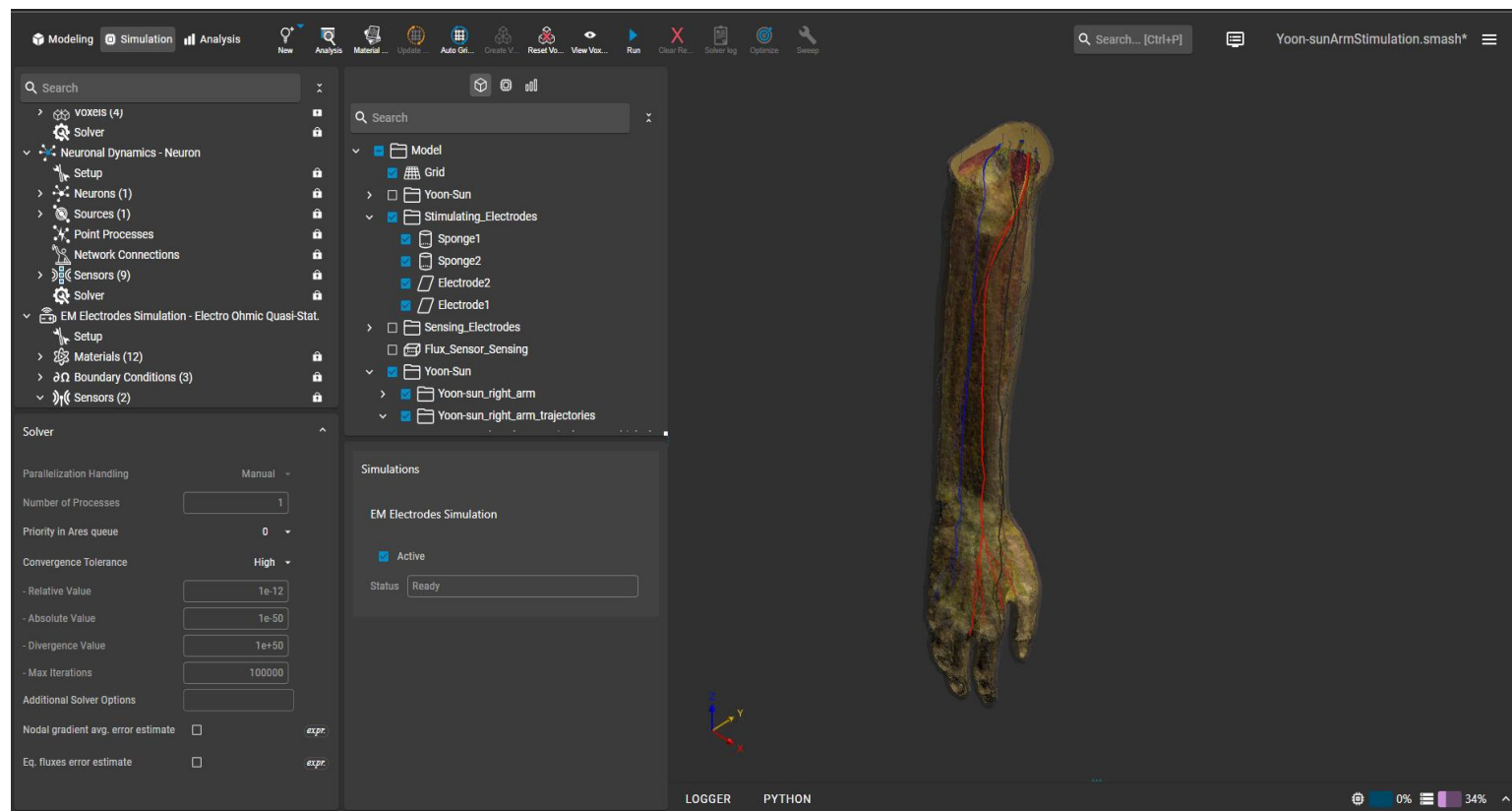
TARGET OF THE SIMULATION

此模擬的功能主要有二：

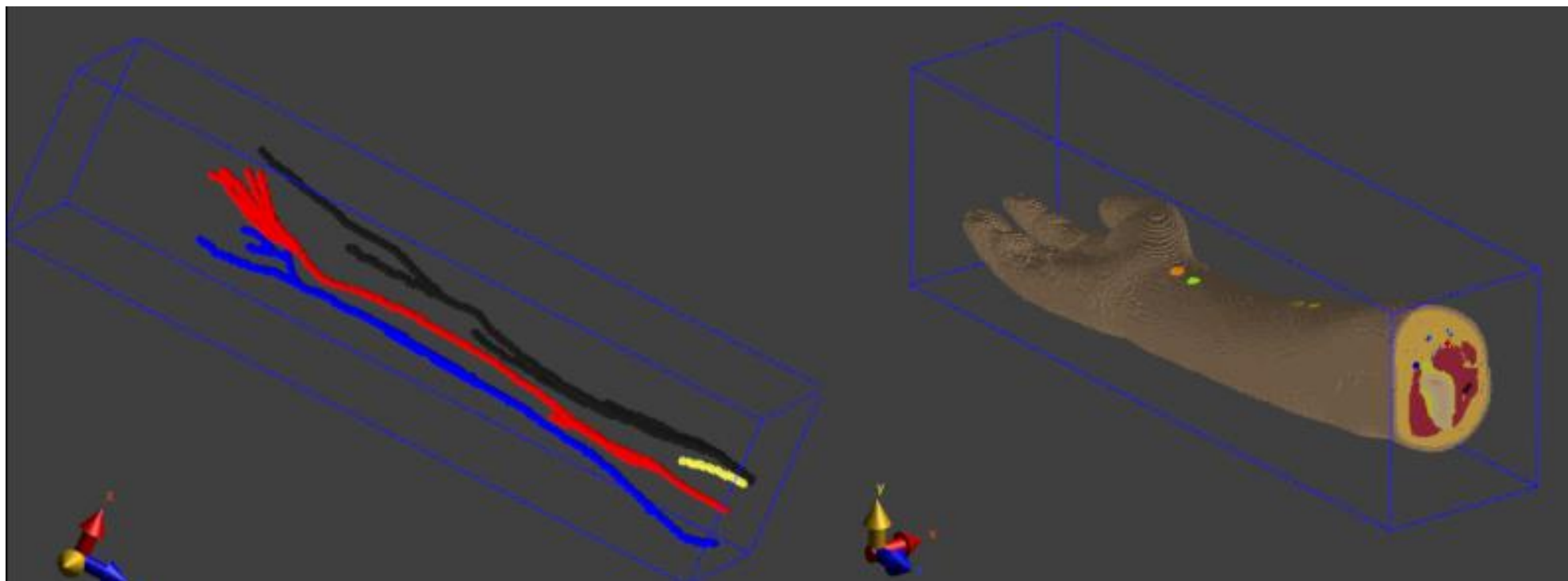
- 1、利用手臂模型模擬準靜態(Quasi-Static)的EM solver在低頻狀態下的功能與應用
- 2、利用相同的手臂模型模擬神經節點的電壓狀態

實驗一基礎設置與步驟

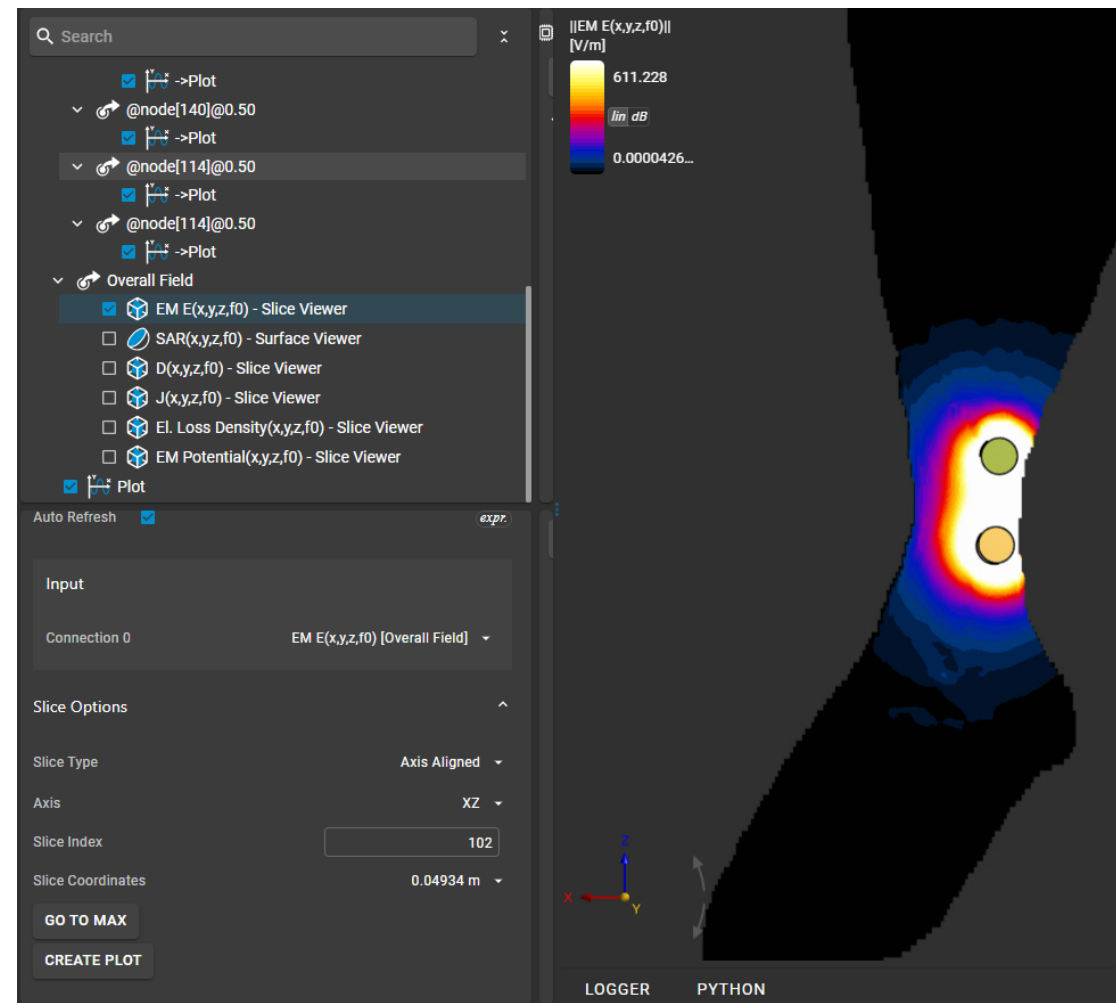
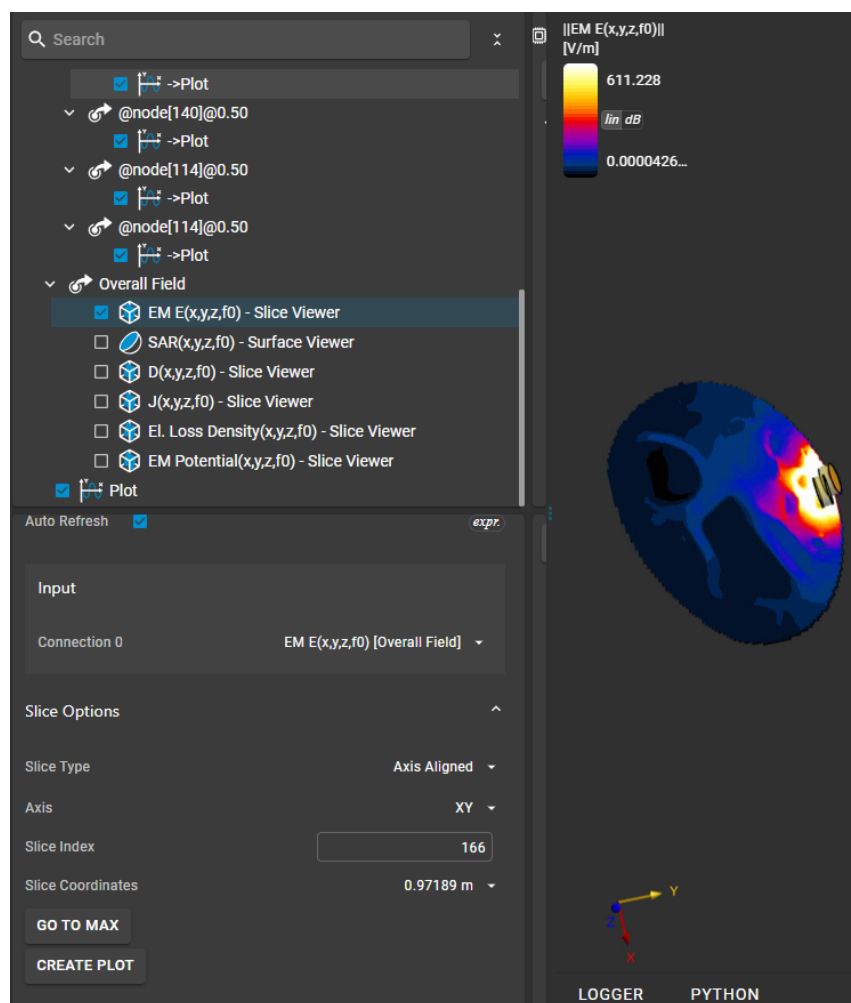
- 1、匯入模型
- 2、Materials
- 3、Boundary Conditions
- 4、Grid
- 5、Voxels
- 6、Solver



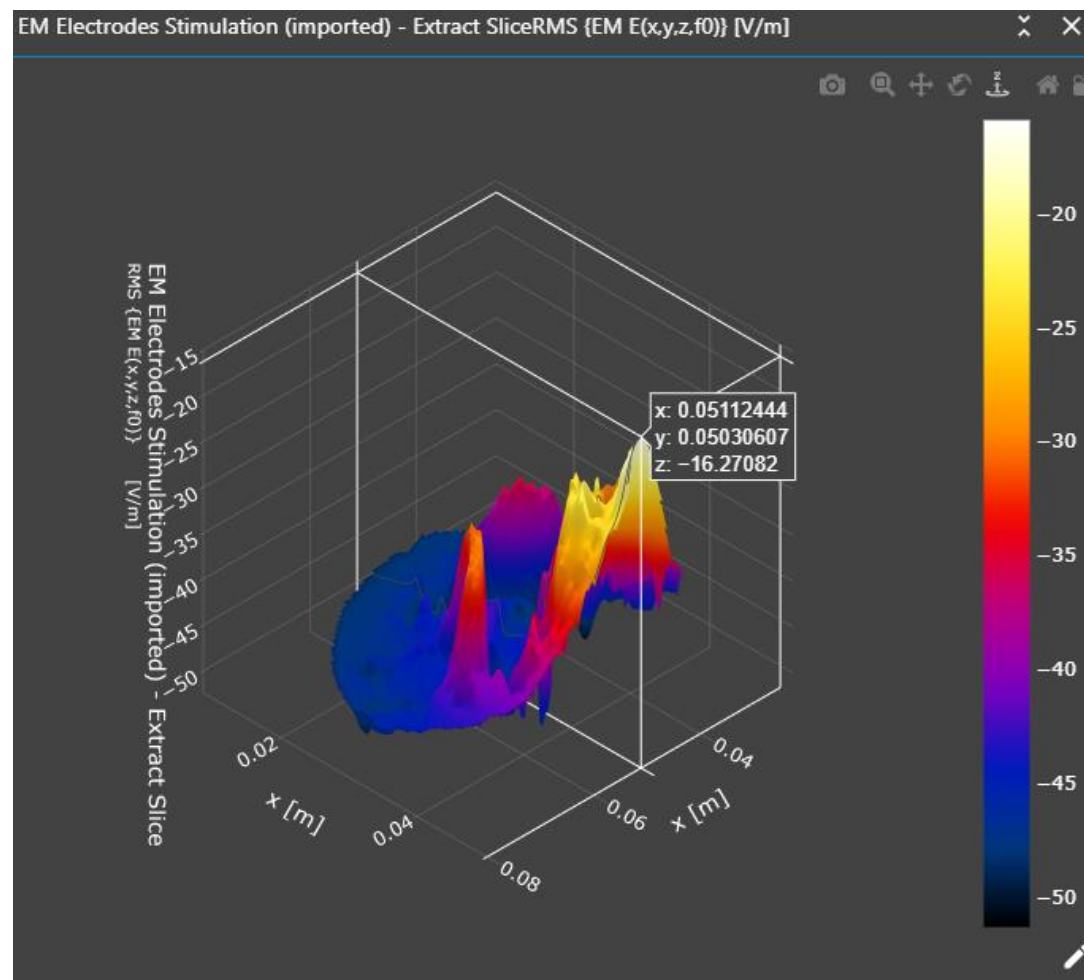
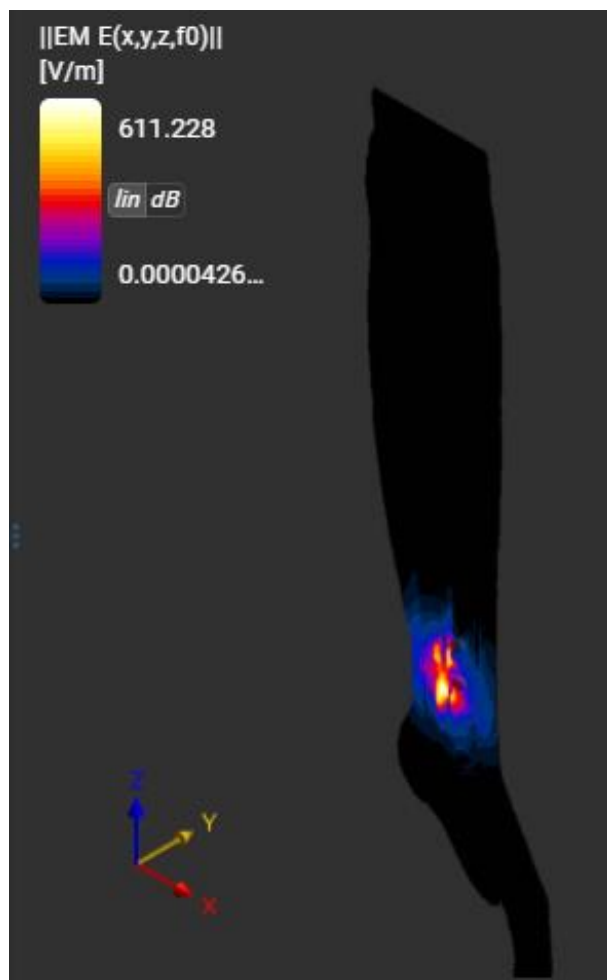
實驗一結果



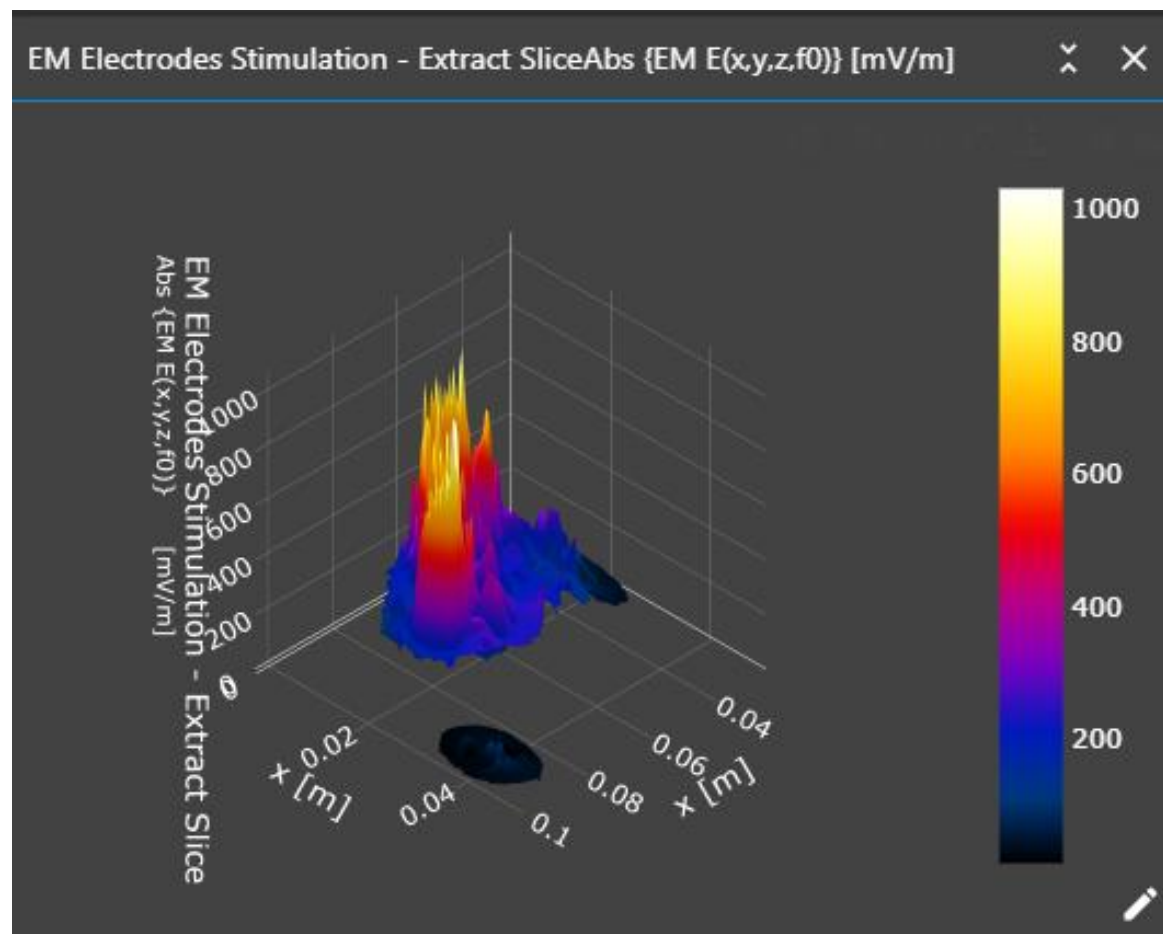
實驗一結果-EM(電場強度)



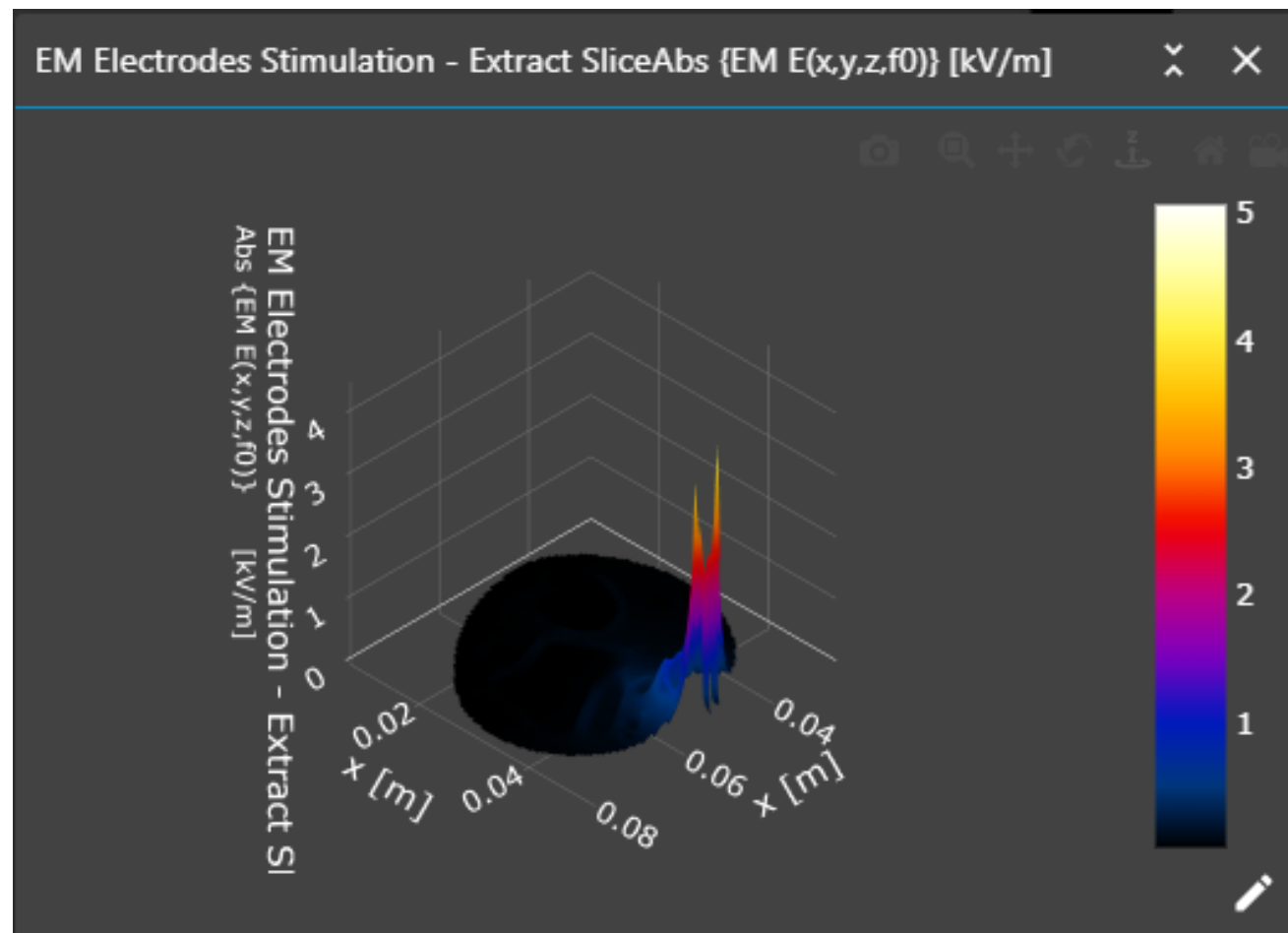
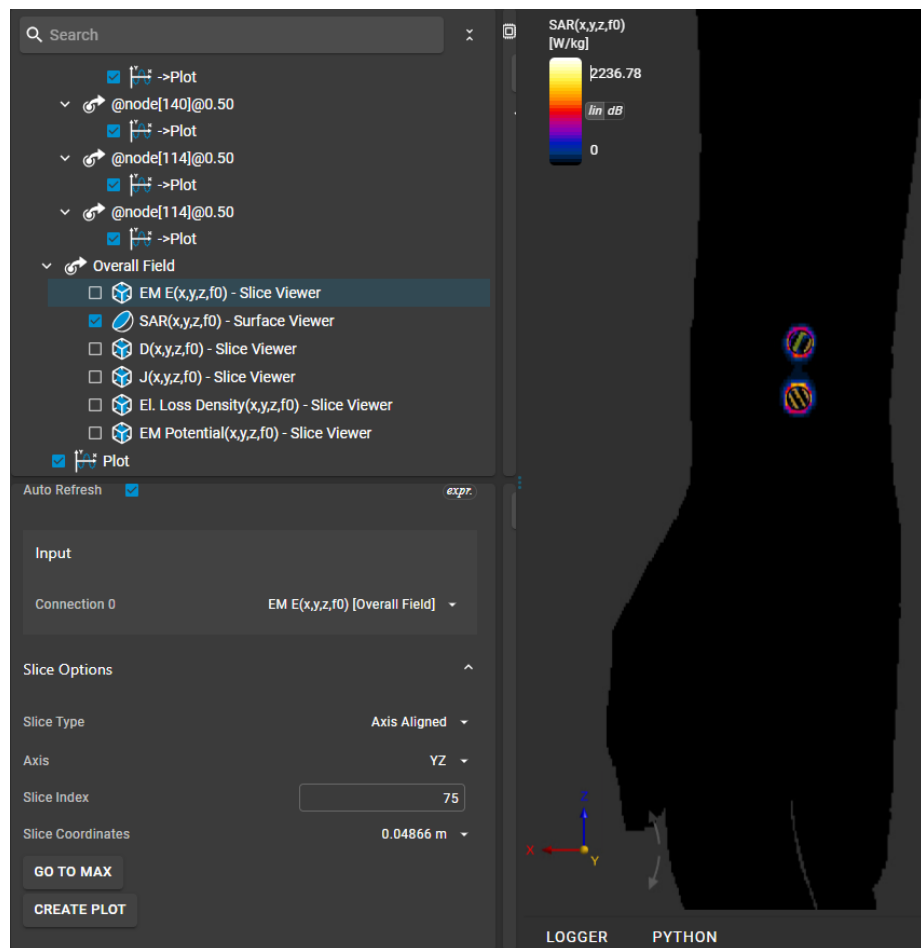
實驗一結果-EM(電場強度)



實驗一結果-電損耗密度



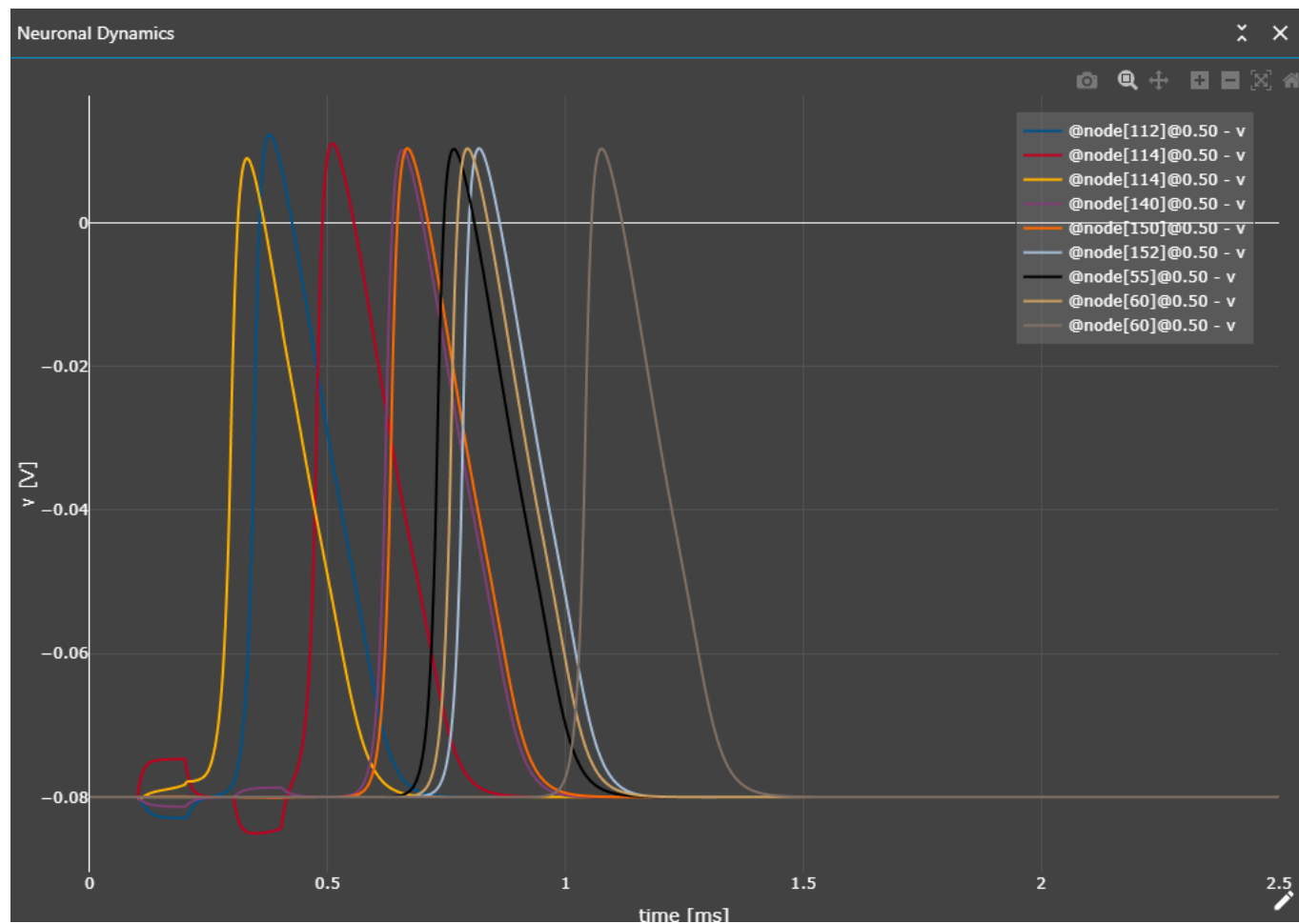
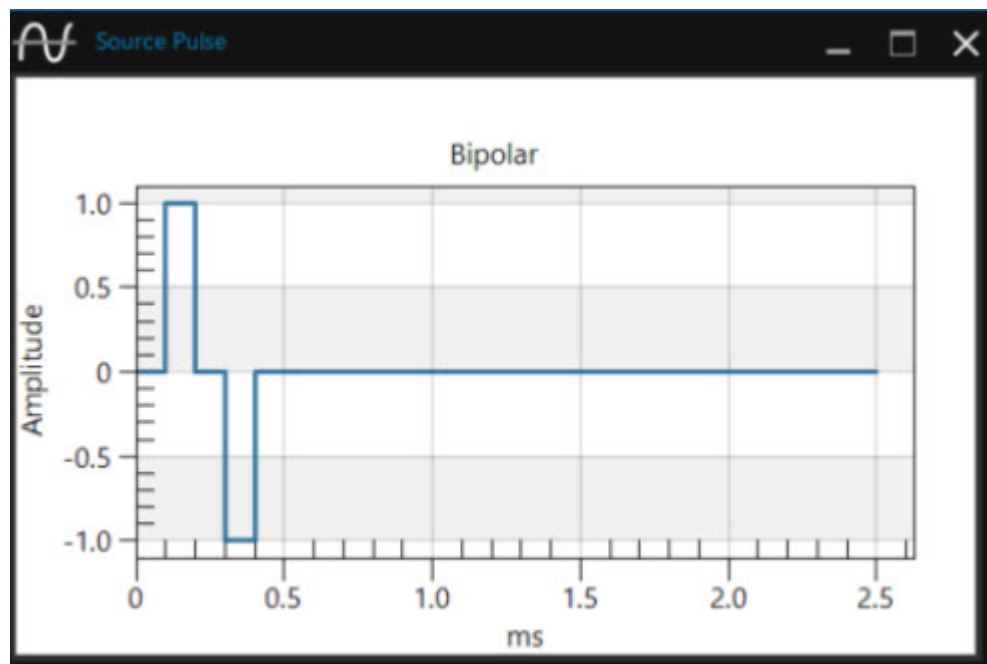
實驗一結果-吸收率SAR



實驗二基礎設置與步驟

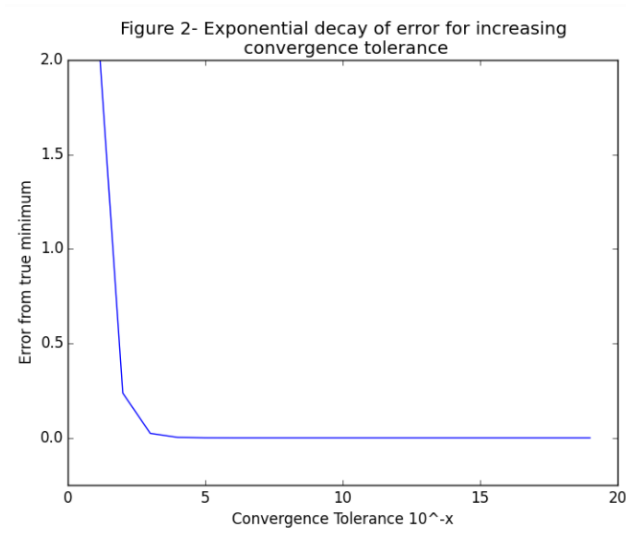
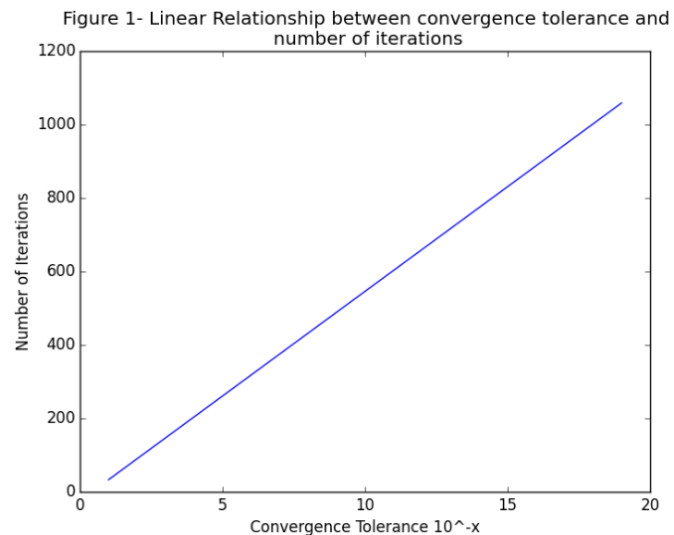
- 1、匯入模型(已於步驟一完成)
- 2、離散化axon fibers
- 3、調整Pulse以做為Source
- 4、調整Sensor
- 5、Solver

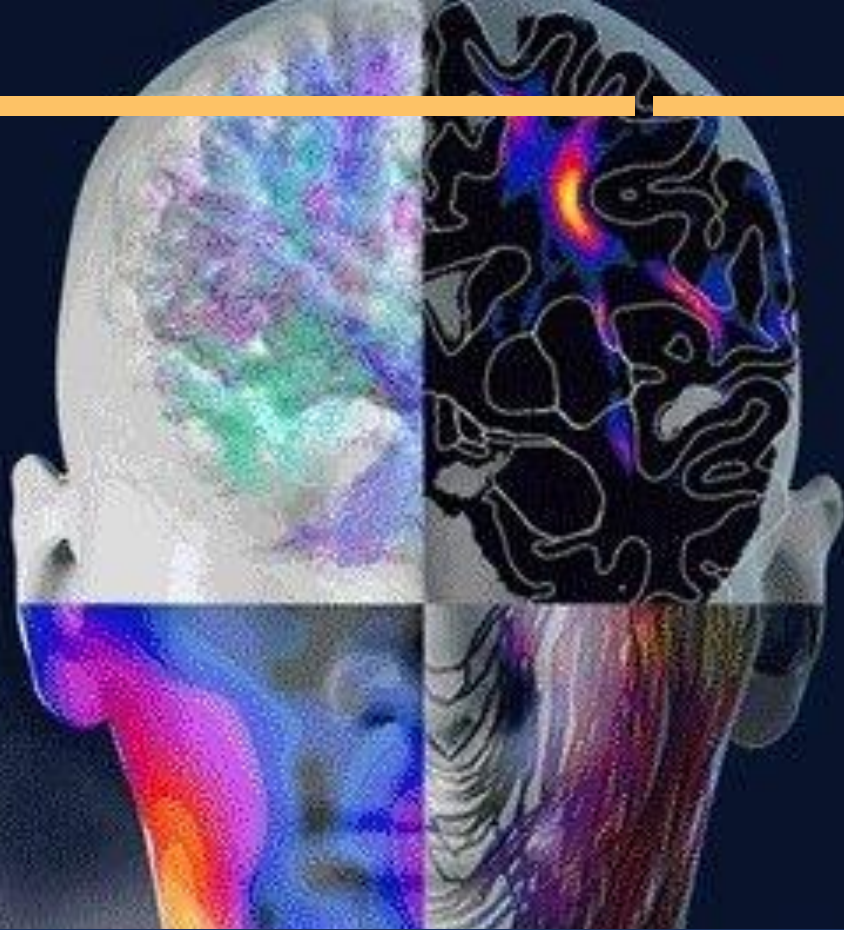
實驗二結果



參考資料

- Application of a quasi-static EM solver to optimization of low inductance film capacitors
- <https://ieeexplore.ieee.org/document/5386362>
- Convergence Tolerance
- <https://www.sciencedirect.com/topics/engineering/convergence-tolerance>





SIM4LIFE/YOON-SUN ARM SENSING

111511282 戴琿楷

實驗一基礎設置與步驟

1、匯入模型

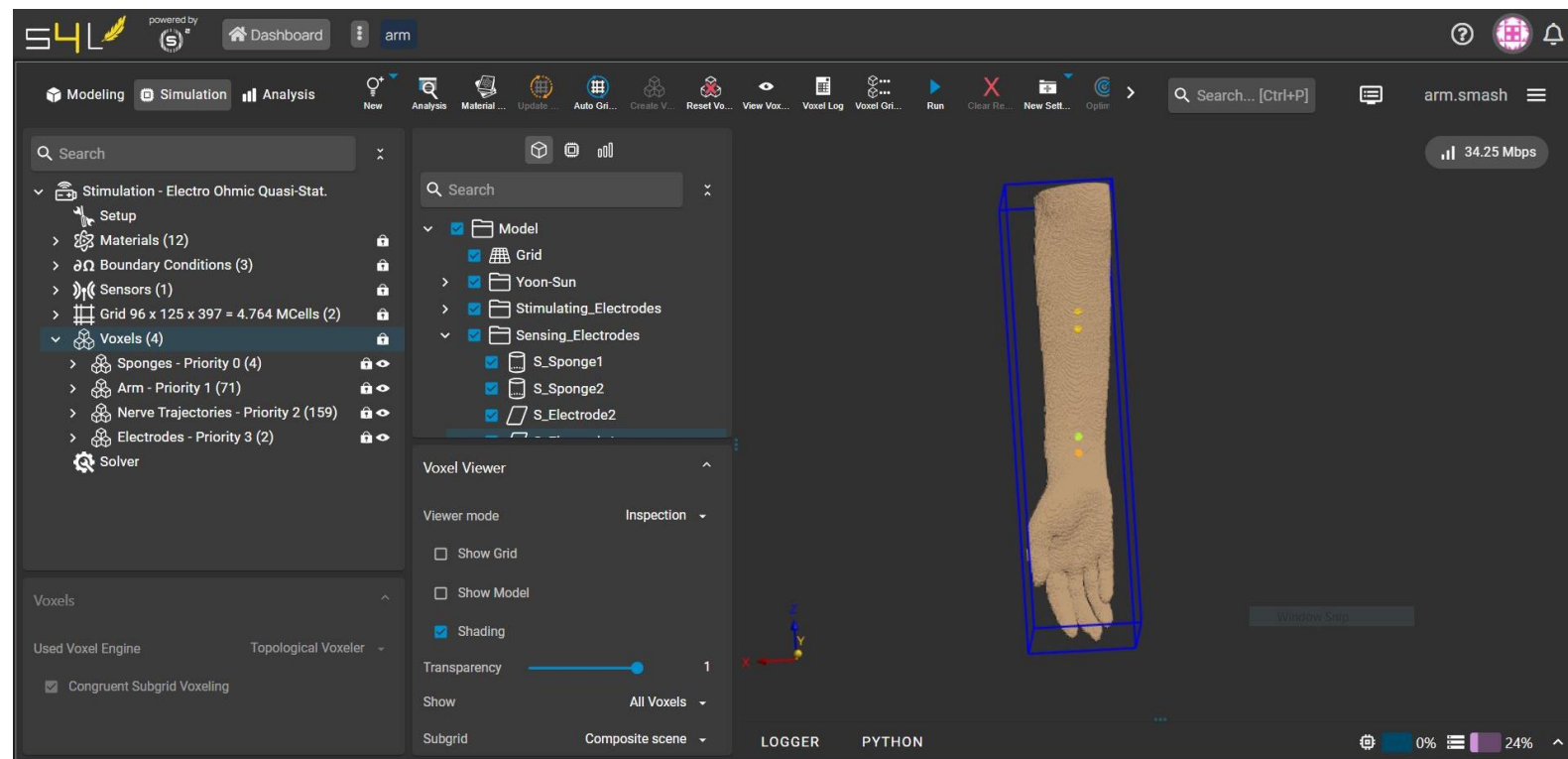
2、Materials

3、Boundary Conditions

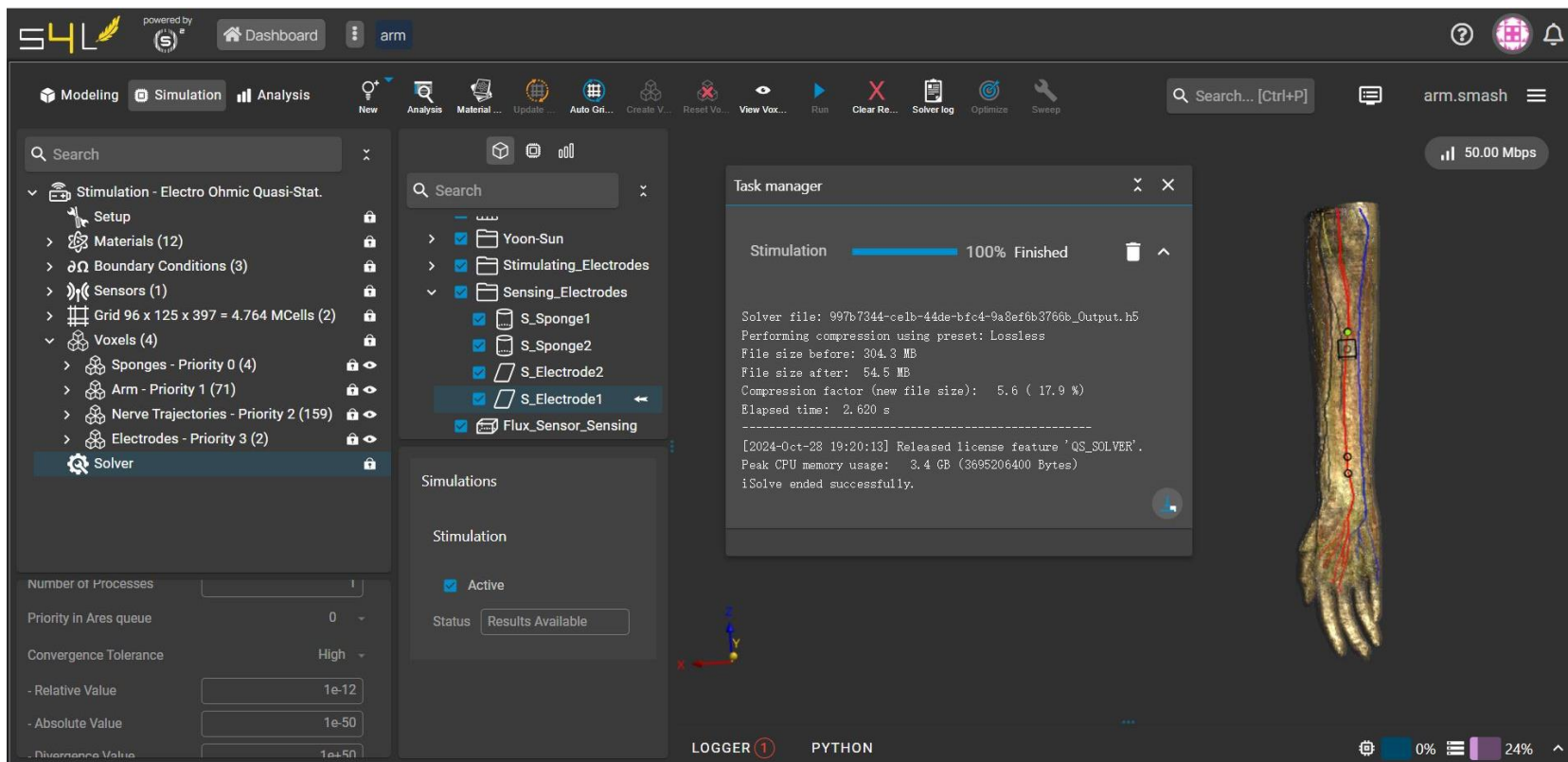
4、Grid

5、Voxels

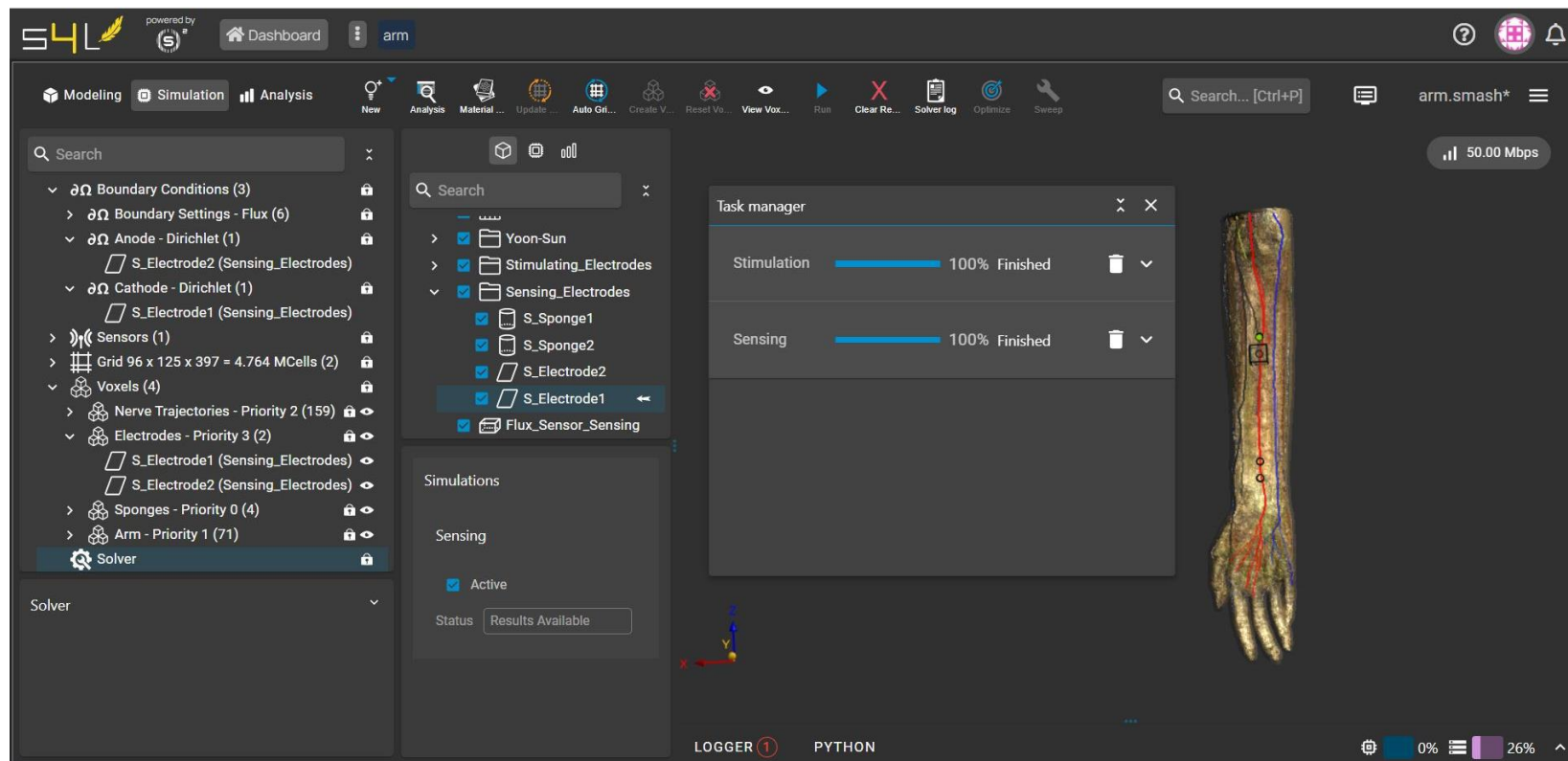
6、Solver



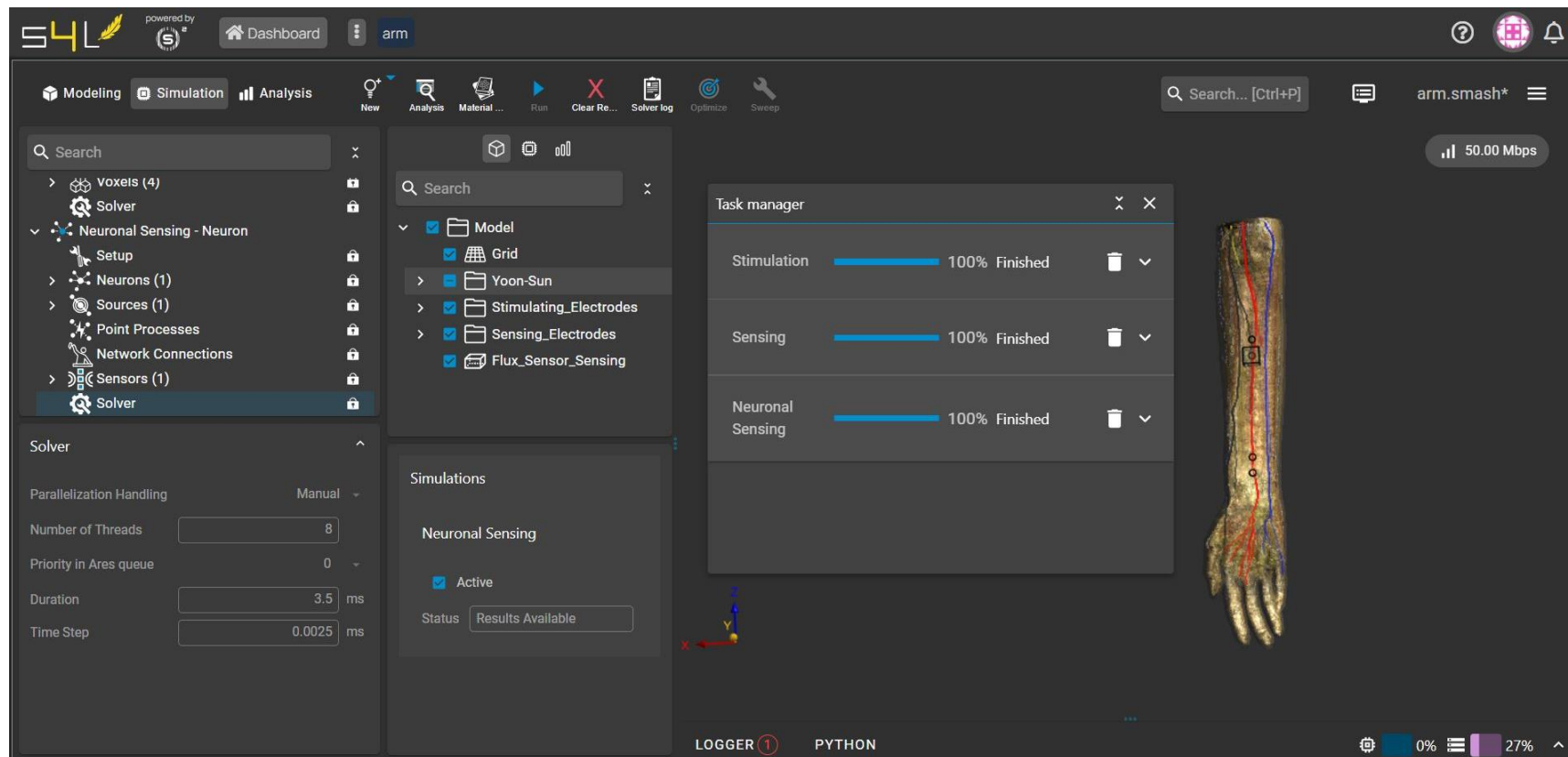
模擬結果



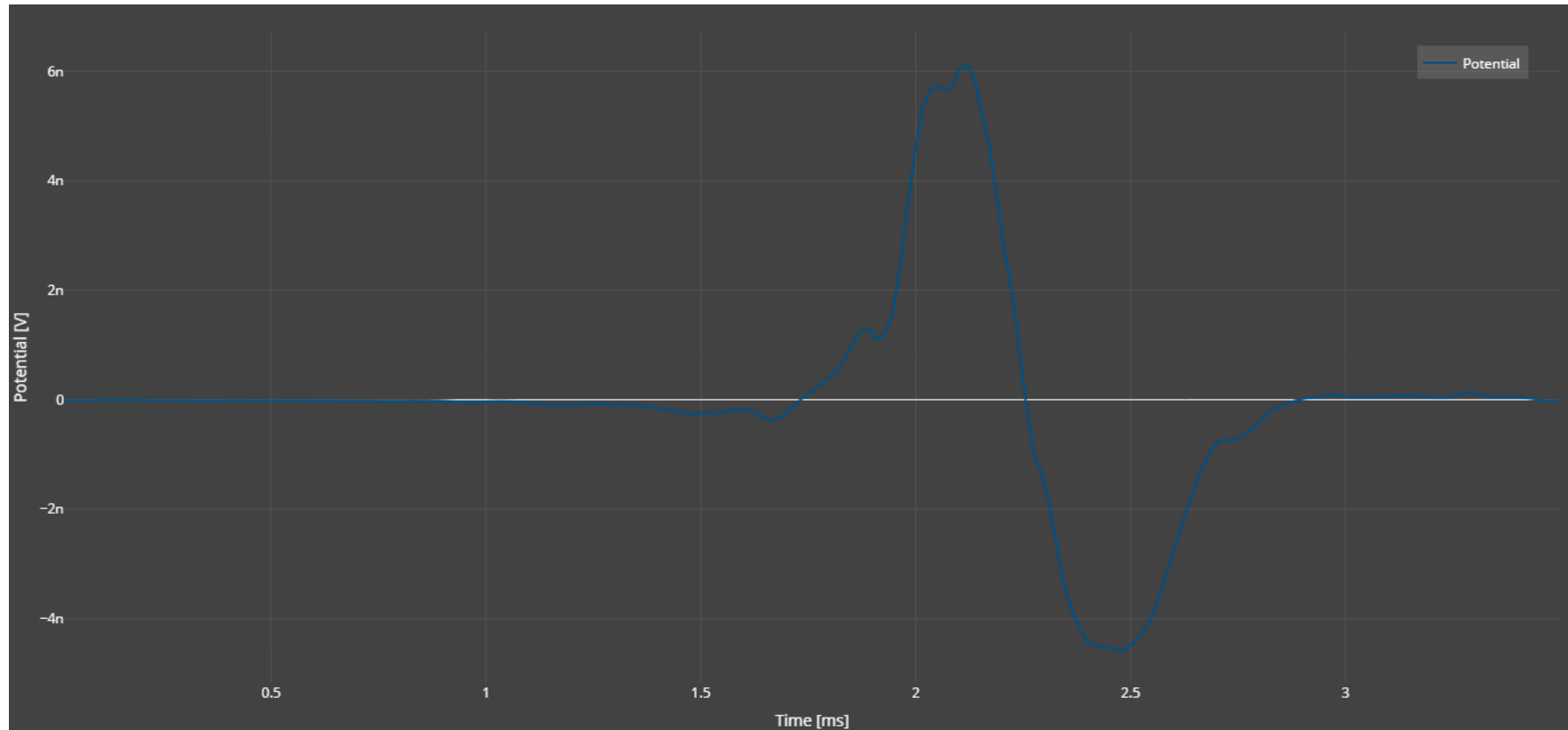
傳感模擬結果



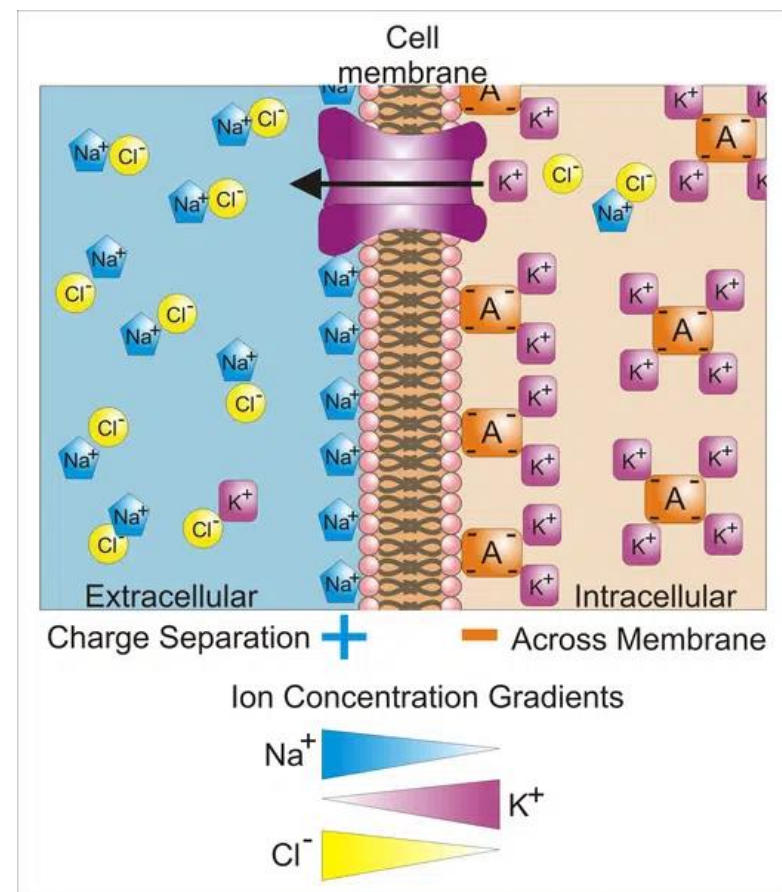
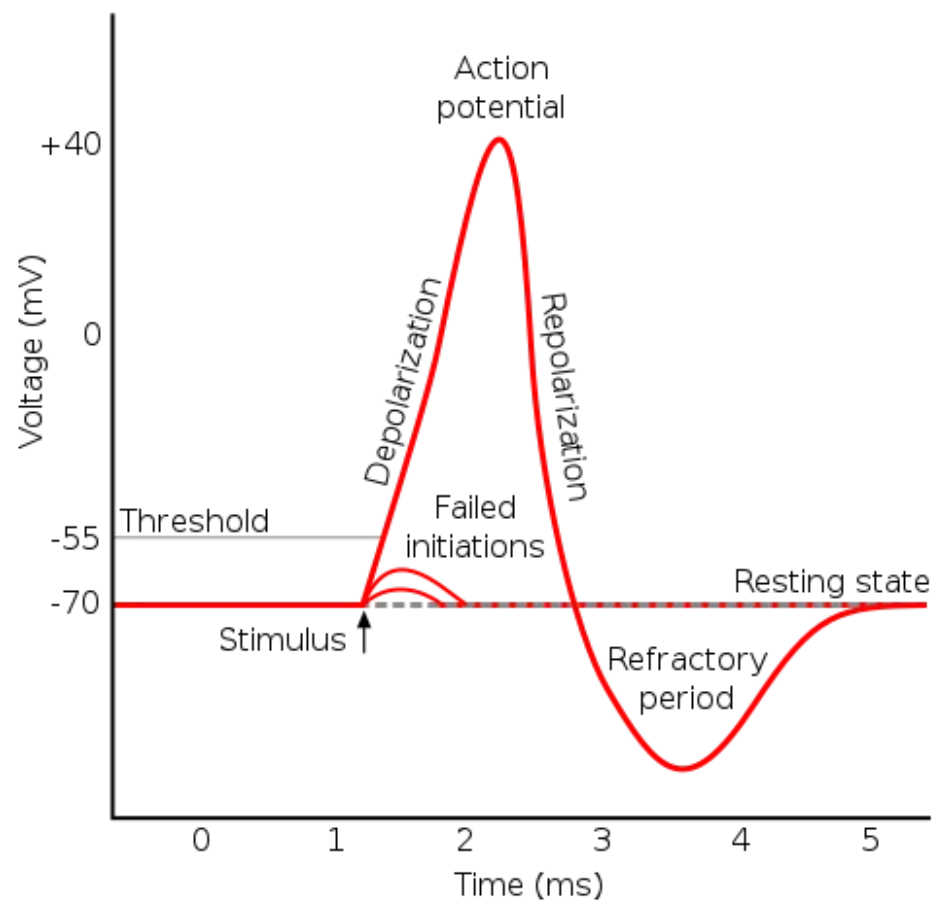
神經傳感模擬結果



PLOT OF THE SIGNAL RECORDED AT THE SENSING ELECTRODE OVER TIME.



動作電位說明





THANK
YOU
FOR
LISTENING