**COMSOL LiveLink**

To use the direct interpolation using the shape functions in COMSOL, the COMSOL model first has to be saved in .m format in COMSOL GUI. If possible, do not add unnecessary steps to the model as this will be recorded in the .m file and will cause the loading time to increase in MATLAB. The option File> Compact History can be used before saving the file to .m format. It is useful to reduce the file size when the COMSOL model has been solved several times.

After saving it to an .m file, run COMSOL Multiphysics 5.3 with MATLAB. This will open a MATLAB window that is linked with COMSOL. Sometimes logging in would be required. The user name and password can be set to anything. In this MATLAB window, open **’Bipolar\_Auto\_raw.m’.** This is the main code to run to generate a spatial map with LiveLink. It works in a similar way to the other code that is used with the gridded data, but it solves the interpolation at the nodes of Ranvier using LiveLink’s *mphinterp* function, which should be more accurate than linearly interpolating the gridded data.

The model’s .m file is loaded on this line:

%Load model

model=optic\_seline;

This will take around 20-30 minutes with the current COMSOL model. To evaluate the potential value and load the data to MATLAB, the function mpheval was used.

As the model in COMSOL use unit current injection, and the units used are mm (for length) and V (for electrical potential), the values are converted to um and mV by executing these lines:

coord=pot.p.\*1000;

coord=coord';

pot=pot.d1.\*1000.\*currents(cur);

coord contains the coordinates of the nodes, whereas pot contains the corresponding potential values.

This code calls **‘testfunct\_eight.m’** to calculate the probability value. The interpolation with *mphinterp* is done in this code. Then, the remaining steps are identical to that of **‘Bipolar\_Auto.m’**.

To check zje