S-TI-S JJ Simulation.vi
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1. before run, set the paramaters on the left of the screen.
2. flux (magnetic field) is in unit of flux quanta.
3. Phaserange is in the unit of Pi, the CPR will be build up according to phase range of [-Phaserange/2,Phaserang/2], and such CPR will be a periodic function with Phaserange as period. Enter integer number of multiple times of 4 is preferred.
4. Use the step setting tab to set resolution of the calculation, you can set how many points is used to define the width of the Josephson junction, how many points to represent the Phaserange
5. Then you can choose which type of the CPR is used.
6. Depending on the choose of the CPR, you may want to set the strength of the MBS, "a" parameter, the width of the gaussian function used, and the pattern of parity of MBS. Parity pattern has to have same number of elements for positive and negative range.
Enter the parity 1 or -1 for positive and negative phase +-Pi, +-3Pi, +-5Pi etc.. in to the two arrays.
7. You can use the index control to read the array elements, then enter the value, you can also delete an element of array by right click, the number of array elements is not limited.
8. You can change the x,y range, zoom, create cursor etc. to help analyse the plot. Right click to save the data into excel.

Enjoy!
Guang Yue

flux start
Set the flux lower bound for calculation

flux end
Set flux upper bound for calculation

flux step
Set flux step resolution.

stop
Stop the calculation of diffraction pattern, phase0

Geometry steps
Number of data points describe the y dimension of the JJ

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CPR Type
Choose type of CPR: regular Josephson effect, non-local MBS, local MBS with same parity, local MBS with different parity for each MBS.

Tab Control

Phase steps
Data points describe the Phase space, [-PhaseRange/2, PhaseRange/2].

Gaussian width
Gaussian function width to localize the MBS.

parity for positive phase
Set up the positive phase range parity of the MBS at location +Pi, +3Pi etc. Use the index control on the left to move the display of the array elements. Set the element by enter the value, right click to remove the element.

parity

Strenth of MBS
Strength of the MBS, "a" parameter of the Sin(f/2) term.

parity for negative phase
Set up the negative phase range parity of the MBS at location -5Pi, -3Pi,-Pi etc. Use the index control on the left to move the display of the array elements. Set the element by enter the value, right click to remove the element.

parity

Run
Click to Run the calculation of the diffraction pattern according to the parameters set below. The plots of diffraction pattern, and the phase0 vs flux will be updated during calculation.

Exit
Exit this program, cloase the app.

hold
Check this to keep the current plot in the next run, such that you can compare plots between different runs.

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Save
Click to save data on the current shown plots. To choose plots, select the interested Tab. The data will be saved as columns of x, y1,y2,y3

Plot tab
Choose the tab to select current plots in the data save process.

Geometry Noise Type
Choose geometry noise type for the current density profile along the y direction. "OFF" assume uniform density of current along the junction.

Plot CPR
Plot CPR according to current setting in the CPR tab.

Plot J vs y
Plot supercurrent vs y position based on the last diffraction pattern calculation.

CPR plot points
Data points needed in the CPR plot.

clearIc
Clear the plot of diffraction pattern and phase0

clear j
Clear the plots of J vs y

clear cpr
Clear the plots of CPR

Plot choice
Choose the data the J vs y plot based on. You can choose the positive or negative diffraction pattern in the last run.

- **Icp**
- **Icn**

Flux
The flux for the J vs y plot

Set Noise
Open up a window to setup noise pattern. Click this button will automatically choose the "Noise ON"

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error out[error out]
This icon will show any errors during the run.

- **status**
- **code**
- **source**

Ic positive
Ic positive in the current calculation

Ic negative
Ic negative in the current calculation

Diffraction pattern plot

Total time s
Total time spent since the start of the calculation.

phaserange in Pi
PhaseRange in the calculation, the CPR will be a periodic function of [-PhaseRange/2, PhaseRange/2] range. This value is decide by the choose of CPR type.

Remaining steps
Remaining steps of the diffraction pattern calculation.

Current Flux
Current flux to calculate diffraciton pattern.

Positive Phase0
Optimized the phase0 in the positive critical current calculation.

Negative Phase0
Optimized the phase0 in the negative critical current calculation.

Phase0 vs Flux

J vs y

CPR

Actual flux
Actual flux used for the plot, which is reduced to the actual flux of a data point.