

SpinW Installation

Must have MATLAB already installed on your computer

Latest version and all releases can be found here:

<https://github.com/spinw/SpinW>

Installation instructions can be found here: <https://spinw.org/installation/> or follow this tutorial

Questions/problems: yang.zhao@nist.gov

spinw.org



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Spin

SpinW is a MATLAB library that can plot and numerically simulate magnetic structures and excitations of given spin Hamiltonian using classical Monte Carlo simulation and linear spin wave theory.

Link will take you to github page with latest SpinW version

The Projects



SpinW

Original SpinW written in MATLAB.



pySpinW

Python implementation of SpinW

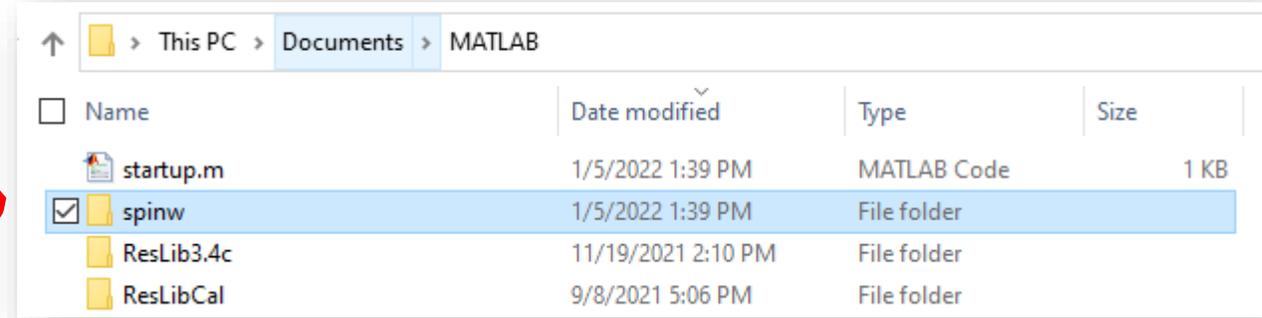


SpinWcore

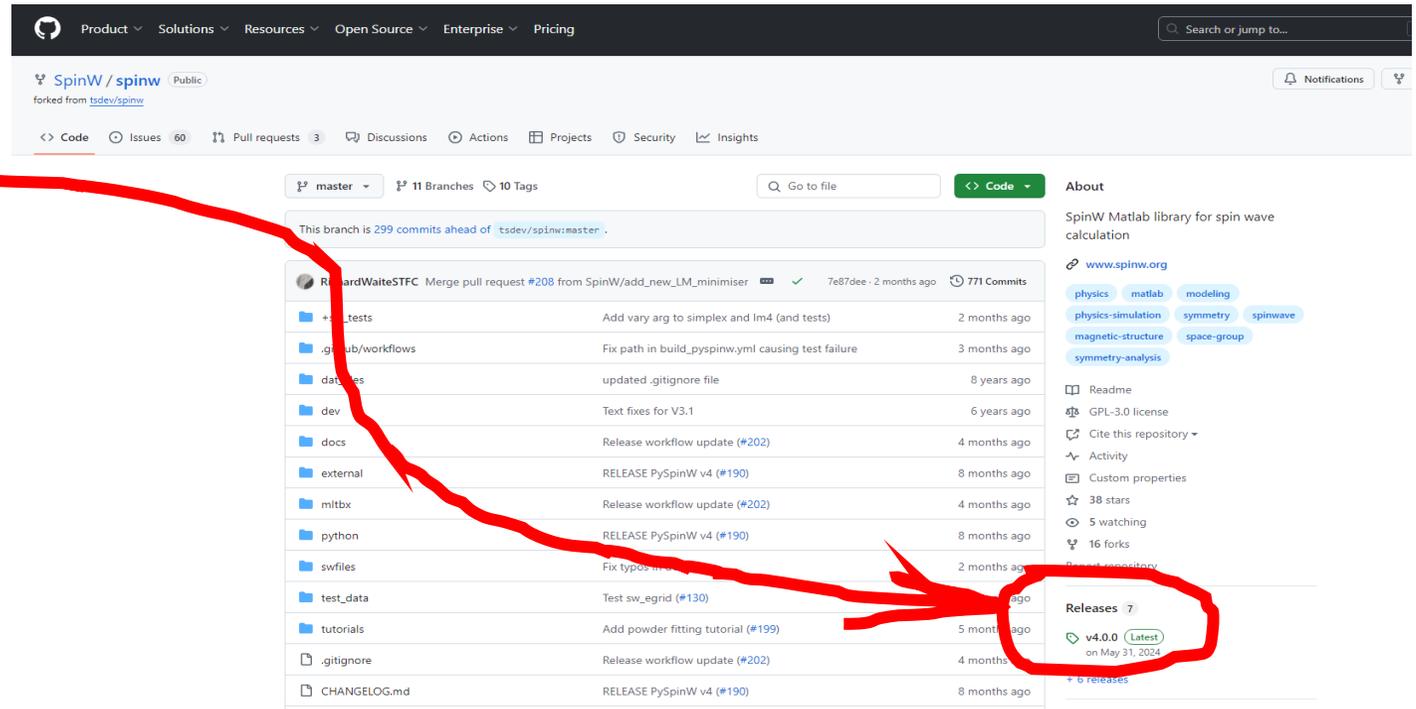
SpinW core functions written in C++ for speed

Installing SpinW from scratch...

- Make a folder called “spinw” in a convenient location *e.g.* the userpath folder, usually in:
 - Windows: %USERPROFILE%/Documents/MATLAB
 - Mac: \$home/Documents/MATLAB
 - Linux: \$home/Documents/MATLAB if \$home/Documents exists

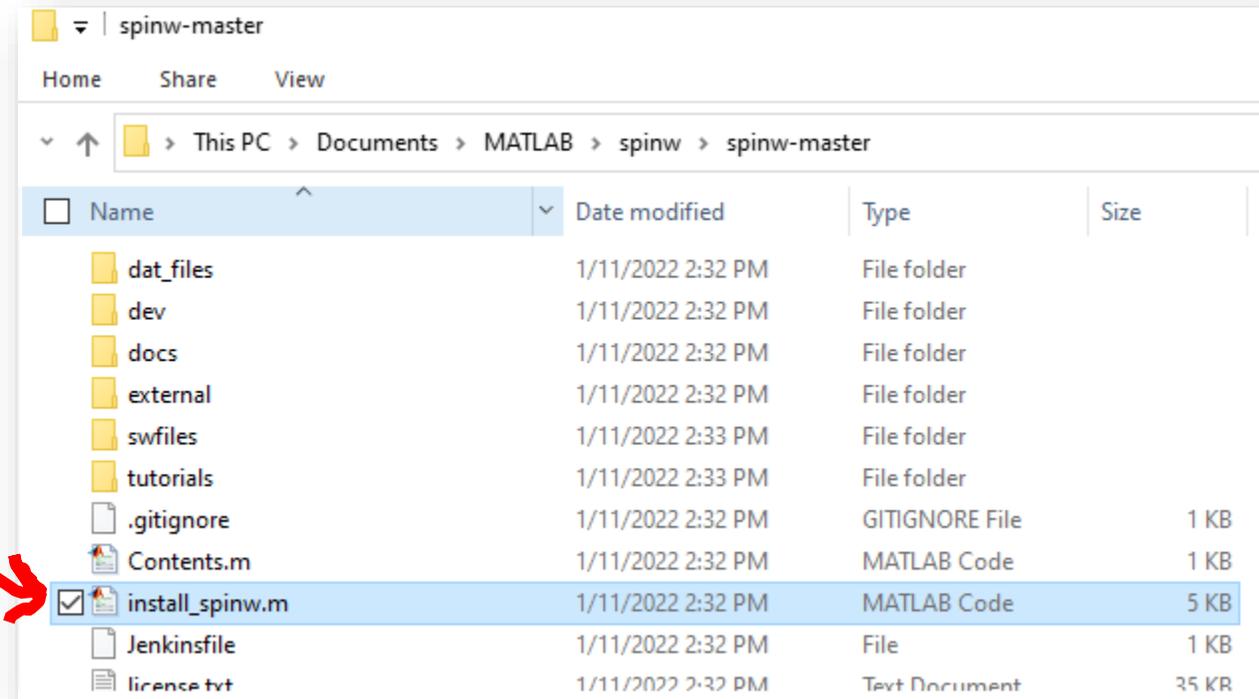


- On github page (<https://github.com/spinw/SpinW>), navigate to the latest version
- Download the source code (zip) and extract files into the spinw folder you created



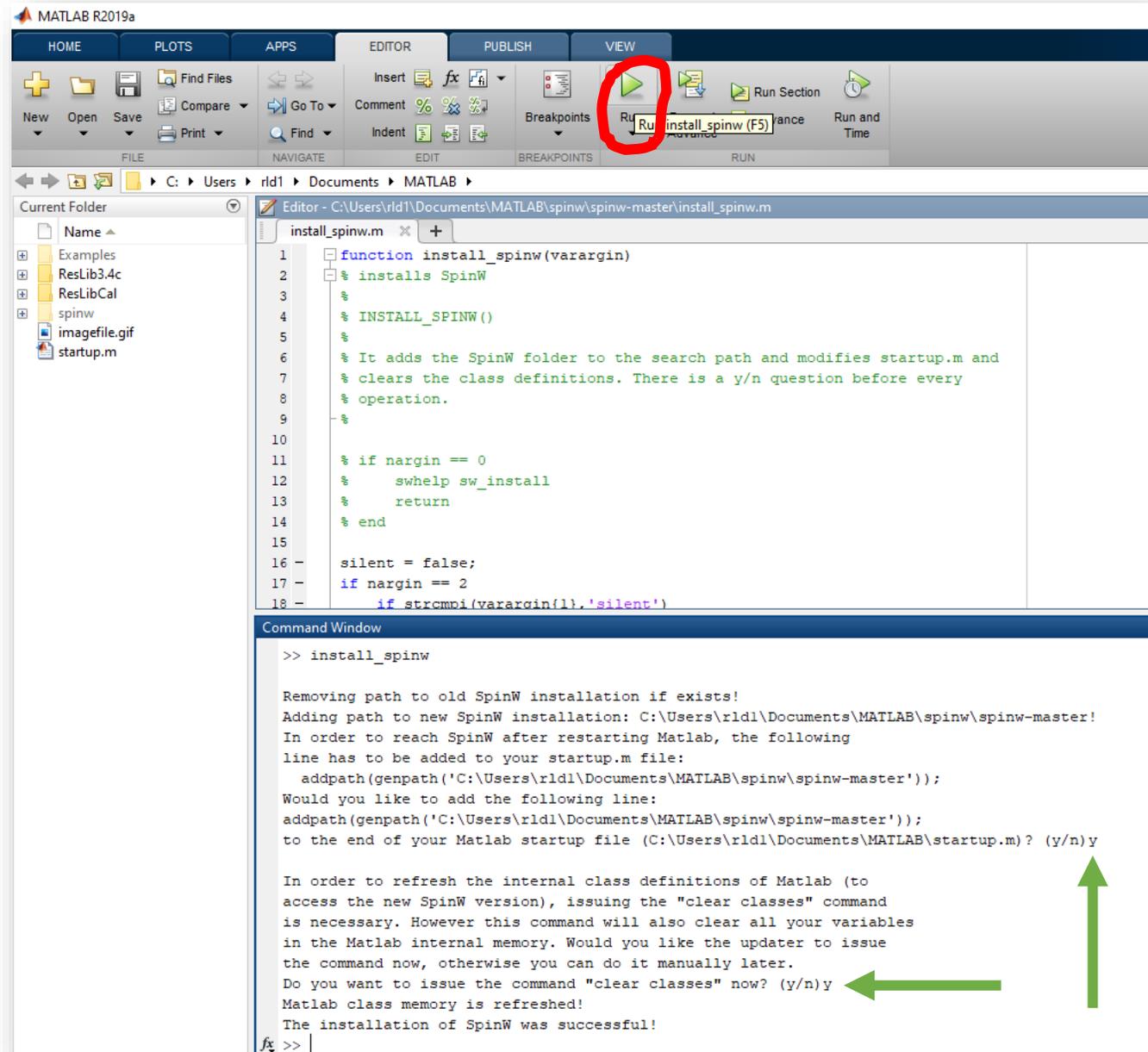
Installing SpinW from scratch...

- Open “install_spinw.m” in MATLAB and run the script. Type ‘y’ for all prompts. This will add the folder with the SpinW files to the startup path so your scripts using SpinW functions can always access the needed files.



Installing SpinW from scratch...

- Open “install_spinw.m” in MATLAB and **run** the script. Type **‘y’** for all prompts. This will add the folder with the SpinW files to the startup path so your scripts using SpinW functions can always access the needed files.
 - If the install is not successful, make sure you have a “startup.m” file in the right place. It should be in your userpath folder. Type `userpath` in the MATLAB command window to see where yours is. See <https://www.mathworks.com/help/matlab/ref/startup.html> for more information
- You should be good to go now!



Test if SpinW is working correctly

- Many tutorials can be found here in the folder:
 ...\`spinw`\spinw-*[version]*\tutorials\publish
- Try opening 'tutorial1.m' and running it

Test if SpinW is working correctly

- For Tutorial 1, three figure windows should appear, and the command window should contain the following information

- Try some other tutorials!

The figure displays several MATLAB windows illustrating the SpinW workflow:

- Editor:** Shows the MATLAB script for defining a spin chain. The code includes comments and commands like `FMchain = spinw;`, `FMchain.genlattice('lat_const', [3 8 8], 'angled', [90 90 90]);`, and `FMchain.addatom('x', [0 0 0], 'S', 1, 'label', 'MCu1');`.
- Figure 1: SpinW plot:** Shows a 3D plot of the spin chain lattice structure with four blue arrows representing magnetic atoms along the x-axis.
- Command Window:** Displays the output of the script, including the magnetic structure table and status messages like "Calculating COMMENSURATE spin wave spectra" and "Calculating powder spectra".
- Figure 2:** Shows the spin wave dispersion plot titled "Spin wave dispersion: $\omega(\mathbf{Q}), T = 0.0 \text{ K}$ ". The y-axis is Energy transfer (meV) from 0 to 5, and the x-axis is $(\xi, 0, 0)$ in 2.0944 \AA^{-1} from 0 to 1. A single orange curve is shown.
- Figure 3:** Shows the convoluted powder spectra plot titled "Convoluted powder spectra: $\text{Re } S^{-1}(\omega, \mathbf{Q}), T = 0.0 \text{ K}$ ". The y-axis is Energy transfer (meV) from 0 to 4.5, and the x-axis is Momentum transfer (\AA^{-1}) from 0 to 2.5. A heatmap shows intensity as a function of energy and momentum transfer.
- Figure 4:** Shows the intensity of the spin-spin correlation function plot titled "Intensity of the spin-spin correlation function: $\text{Re } S^{-1}(\omega, \mathbf{Q}), T = 0.0 \text{ K}$ ". The y-axis is Intensity (arb. u.) from 0 to 2, and the x-axis is $(\xi, 0, 0)$ in 2.0944 \AA^{-1} from 0 to 1. A horizontal blue line is shown at an intensity of approximately 0.5.