07-VisIt-visualization

We'll see how to create and plot new types of data using the tool `Expressions` for a *vtk* file that contains some arrays.
==It can help us see vector fields!==

More about `Expressions` [here](#).

Note: Done with VisIt 3.1.2 and written in Obsidian 1.7.7.

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1. Open a file

Open VisIt, click on `Open` and choose a file, which can be a database of same-format and similar-name files if `File grouping` is enabled (I think it is by default).
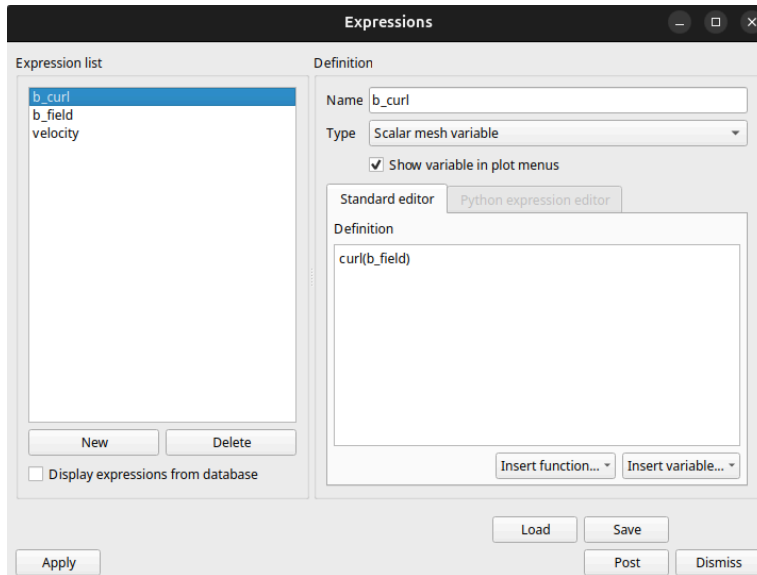
2. Create expressions

Go to `Controls > Expressions` and click on `New`. There, add the expression you want by giving it a **self-descriptive name**, specifying the **type of the output**, and **typing it down**.

Let's see some examples!

- Velocity $\vec{v}$: Here, `vx1` and `vx2` are the names of the velocity arrays of the files I opened, and `{,}` is used to define vectors.
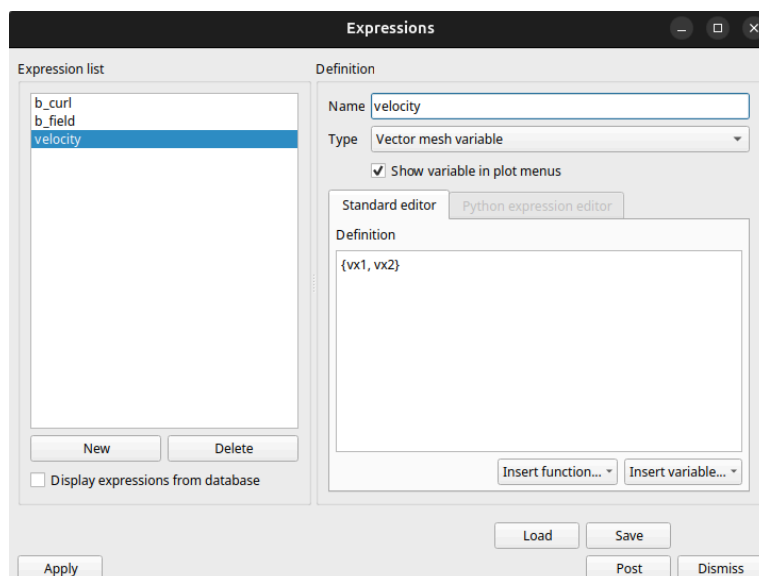
- Magnitude of $\nabla \times \vec{B}$: Notice how it is defined in terms of another expression (`b_field` = `{Bx1, Bx2}`).

Once your expression is ready, be sure to click on `Apply`.

3. Save expressions

By clicking on `Save`, you can (of course) save your expressions in a folder of your choice. If you don't do this, you'll have to create them *again* if you exit VisIt.
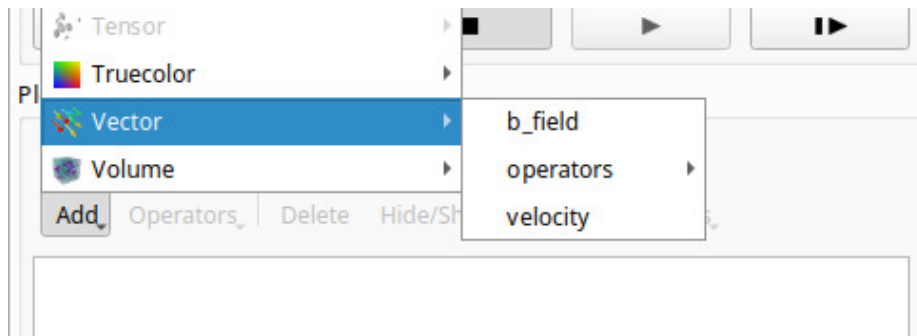
To access saved files, click on `Load` and you should see a similar pop-up window as the one below.
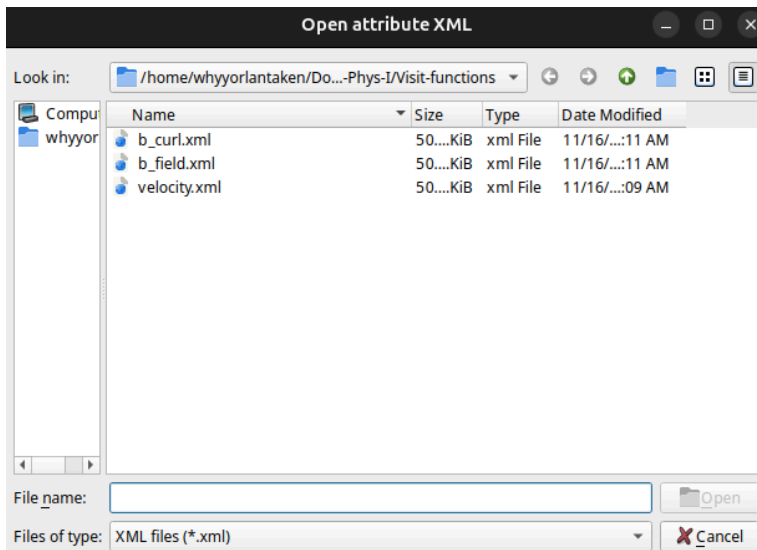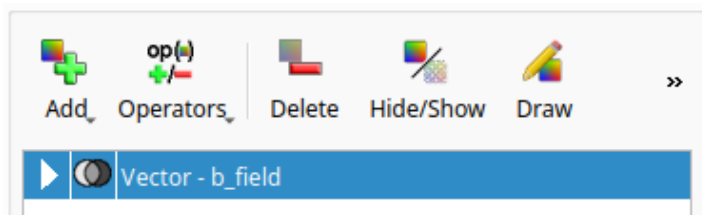

4. Usage

4.1 Selection

Back in the main window, click on `Add` and look for your expression depending on its type. For example, let's see the `Vector` options.

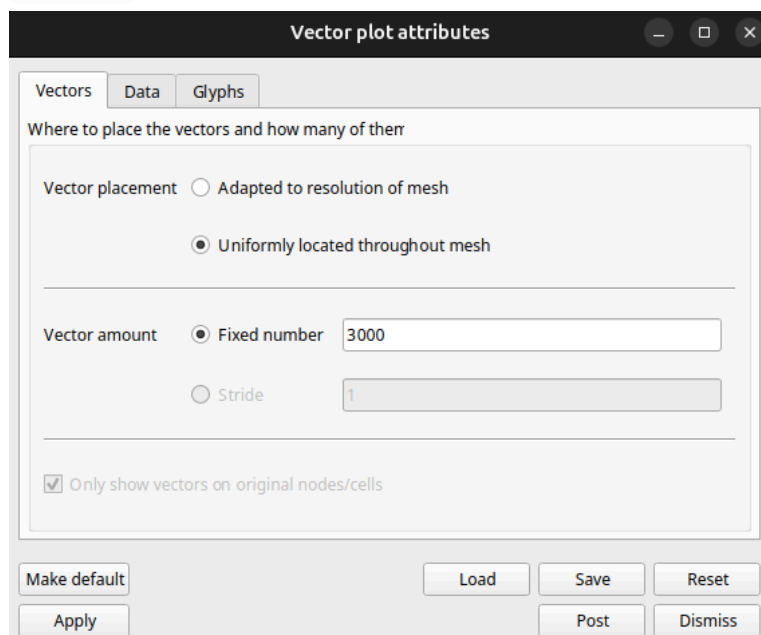Choose one and click on `Draw`!

4.2 Attributes

Your result might not initially look great, but that's totally normal. There's always some formatting needed. For that, double click on the object (in my case `Vector - b_field`)
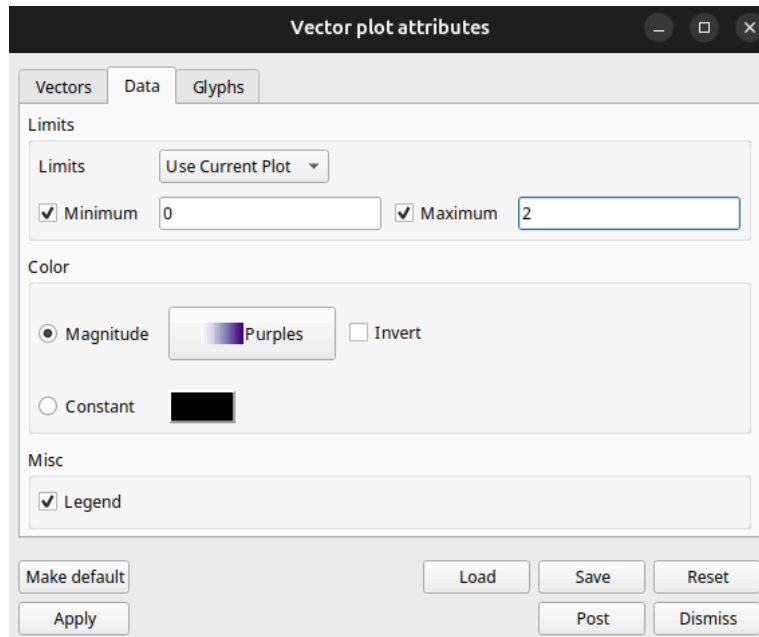

to see the `attributes` window, where you can easily modify the appearance of fields.
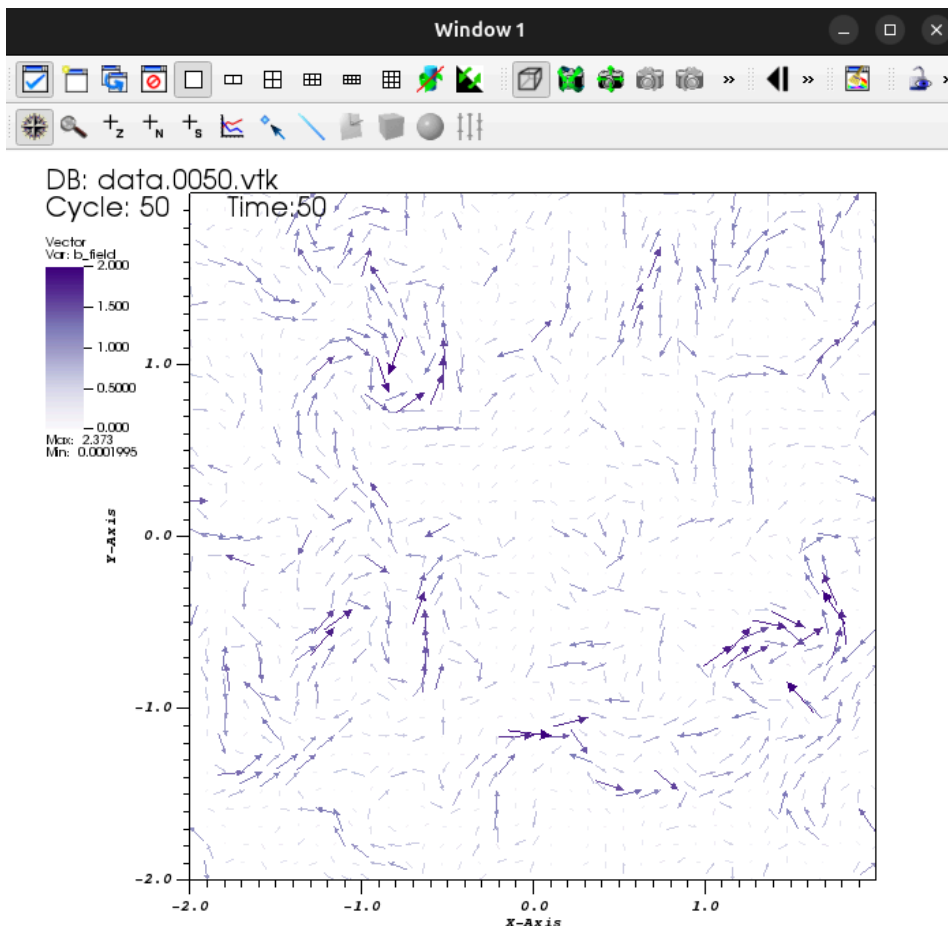
I used these settings for my files:

- Vectors

- Data

- Glyphs : I left it as default.

Click on Apply and your result should be similar to this, which is much much much better.

As you might have noticed, you can also **save your settings** so that you don't have to do it all again!

5. Combinations

By combining types of data, you can sort of reach what you can do in `python` with `matplotlib` tools. Like below where I drew a vector and scalar fields together.
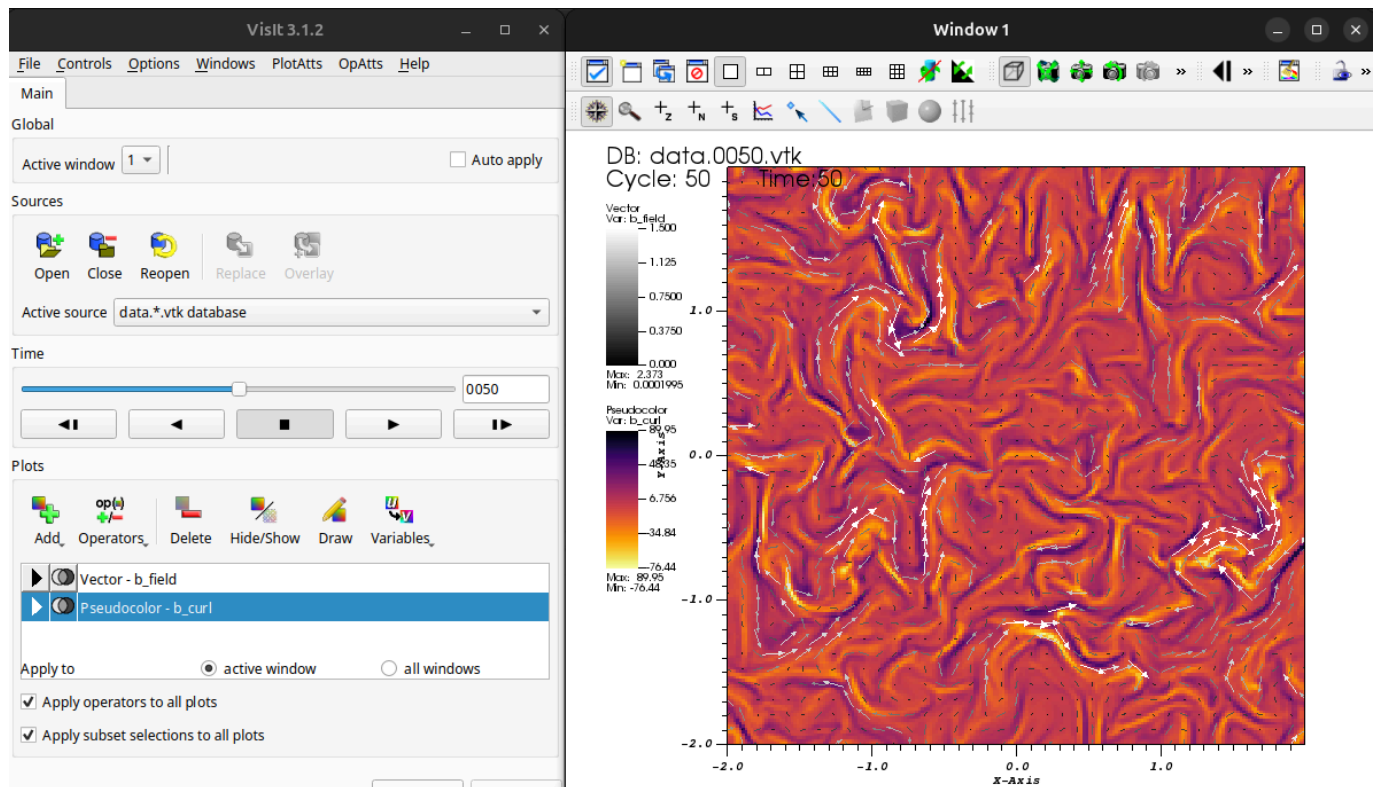
It's up to you.

Mini-tutorial ends here, I hope you found it useful.
Have a great day! :)

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