

Demag_GUI Usage and Tips (Version 4.0)

Installing

After downloading the [PmagPy repository](#) from github, to run this version of demag_gui it is necessary to download a working version of [python](#) (preferably python 2.7), the latest version of the visualization library [wxpython](#) on your architecture, and the basic scientific libraries part of the [scipy project](#).

Launching

The Gui may be launched either with the command line by going to the directory containing demag_gui.py and running it with:

```
python ./demag_gui.py
```

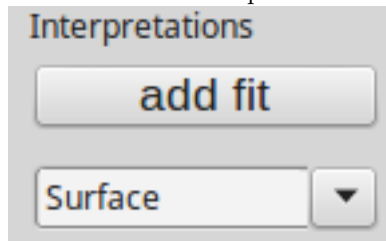
If you have QuickMagIC already running you can launch demag_gui by just clicking on the demag_gui button in the main window shown below:



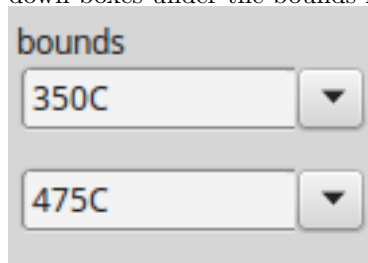
Interpretation of Specimen Data

Adding Interpretations:

You can analyze specimen component data by adding fits with the add fit button. Additionally you can select the fit you would like to edit or view by using the drop down box under the add fit button. Once you have selected a fit the shape of the selected fit's data points will turn to a diamond shape to distinguish them from the other data points.



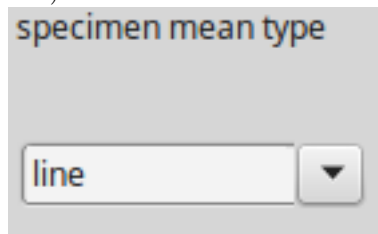
Once you have selected the desired fit you can edit its bounds using the drop down boxes under the bounds header



Alternatively you can double click the list of measurement steps on the left to pick out the bounds of your interpretation. The included steps in the currently selected interpretation are shown in blue on this list and measurement steps marked bad are shown in yellow. (This method of selecting bounds is recommended for mac users who have in the past experienced problems with the drop down boxes)

| i | Step | Tr | Dec | Inc | M |
|----|------|-------|-------|------|---------|
| 7 | T | 450.0 | 179.1 | -0.0 | 4.83e-0 |
| 8 | T | 480.0 | 169.9 | 9.7 | 4.54e-0 |
| 9 | T | 500.0 | 169.2 | 12.5 | 4.21e-0 |
| 10 | T | 510.0 | 165.2 | 14.6 | 3.97e-0 |
| 11 | T | 520.0 | 159.2 | 15.7 | 3.66e-0 |
| 12 | T | 530.0 | 164.3 | 16.7 | 3.26e-0 |
| 13 | T | 540.0 | 165.3 | 16.7 | 3.02e-0 |
| 14 | T | 545.0 | 160.8 | 18.6 | 2.48e-0 |
| 15 | T | 550.0 | 159.7 | 15.8 | 2.11e-0 |
| 16 | T | 555.0 | 170.6 | 17.2 | 1.64e-0 |
| 17 | T | 560.0 | 165.5 | 18.2 | 1.30e-0 |
| 18 | T | 565.0 | 162.0 | 18.5 | 8.99e-0 |
| 19 | T | 568.0 | 161.3 | 19.8 | 6.30e-0 |
| 20 | T | 571.0 | 153.7 | 25.0 | 3.39e-0 |
| 21 | T | 571.0 | 162.0 | 20.8 | 3.27e-0 |
| 22 | T | 574.0 | 175.0 | 11.5 | 1.86e-0 |
| 23 | T | 577.0 | 121.0 | 67.1 | 1.14e-0 |
| 24 | T | 577.0 | 130.0 | 57.1 | 9.11e-0 |

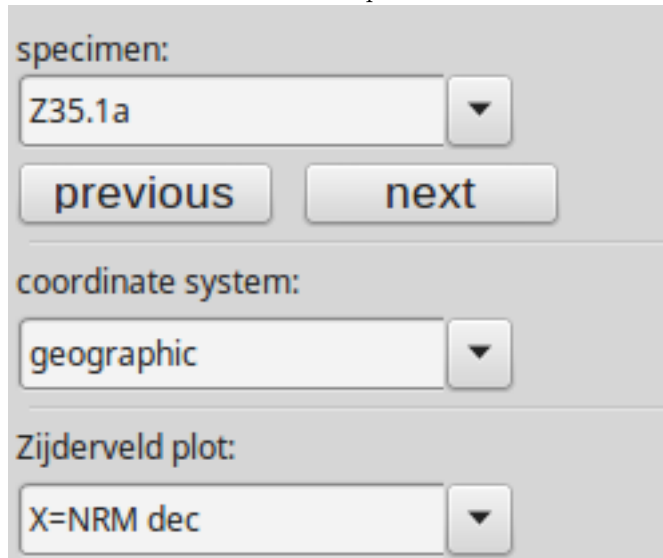
You may notice that the fit will be given a generic name such as *Fit 1* you can change the name of the fit from default by typing into the drop down box containing fits then pressing enter. You can anchor your interpretation or perform a plane fit using the drop down box under specimen mean type (default: line).



specimen mean type

line ▼

Coordinate Systems available as well as orientation of Zijderveld are available on the left above the list of steps.



specimen:

Z35.1a ▼

previous next

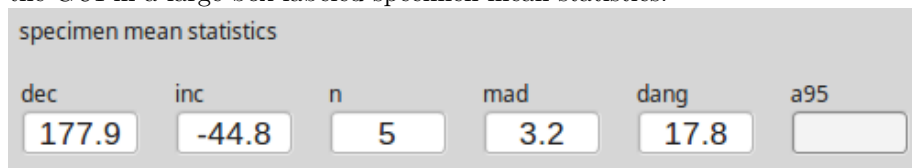
coordinate system:

geographic ▼

Zijderveld plot:

X=NRM dec ▼

The properties of the current interpretation can be seen in the upper center of the GUI in a large box labeled specimen mean statistics.



specimen mean statistics

| dec | inc | n | mad | dang | a95 |
|-------|-------|---|-----|------|-----|
| 177.9 | -44.8 | 5 | 3.2 | 17.8 | |

Flagging Bad Measurement Data

You can set acceptance criteria to a pmag_criteria table by using Analysis/“Acceptance Criteria”/“Change Acceptance Criteria”. If any measurement steps are bad you can flag them as such by right clicking on the list of measurement steps to the left of the GUI. If you flag a step bad that you would later like to restore you can simply right click on it again and it will be flagged as good again.

Plot Interface

The 4 plots that take up the majority of the center of the GUI are where you will see your data and interpretations displayed. In addition they have a new and somewhat unintuitive interface which likely needs explanation. The zijderveld and the 2 equal area plots are by default set to zoom when you left click and drag your left mouse button you will zoom to the dragged out rectangle (currently equal area plots do not draw this rectangle as you drag your mouse but still zoom). On the zijderveld plot it is possible to switch between zoom and pan functionality by right clicking, once in pan mode the mouse will turn into a hand allowing you then to click and move around the plot. On both the zijderveld and equal area plots if you wish to return to the original plot simply click the middle mouse button (in the absence of a middle button pressing both right and left mouse buttons at the same time does the same thing) to return to home position. Lastly when mousing over the equal areas if you end up over the top of a interpretation plotted there you can double click on it to switch the specimen and current interpretation to the clicked interpretation.

Saving Specimen Interpretations

Once you have picked out your interpretations you can save the session data in two different ways a .redo file or pmag tables. In addition you may save image files of the plots.

The .Redo File: You can use Analysis/“Save current interpretations to a redo file” to create this file type or you can just hit the save button next to add fit, this method is recommended as it prevents accidental pressing of the clear all interpretations button. **Note:** this file type does **NOT** load previous interpretations on start up you must go to the menu option Analysis/“Import previous interpretations from a redo file” to restore your previous session.

The Pmag Tables: By going to the menu File/“Save MagIC pmag tables” you can export your interpretations made in Demag GUI to the MagIC pmag tables which can then be used by other MagIC programs or uploaded to the

MagIC database. You can export any or all of the 3 coordinate systems upon selecting this option and you may choose to save pmag_samples, pmag_sites, and pmag_results tables in addition to the pmag_specimens table that is output. If you choose to output additional information you will be prompted by a pop up window for additional information. **Note:** this save format loads on start up of the GUI immediately restoring your session, also selection of this option will overwrite your demag_gui.redo file in the working directory.

Images of Plots: Select the menu option File/“Save plot”/“Save all plots” to save all plots alternatively you can save any of the plots individually. Some examples can be seen below:

Zijderveld plot

Z35.1a

X-axis rotated to NRM (177); NRM=3.93e-07 Am²

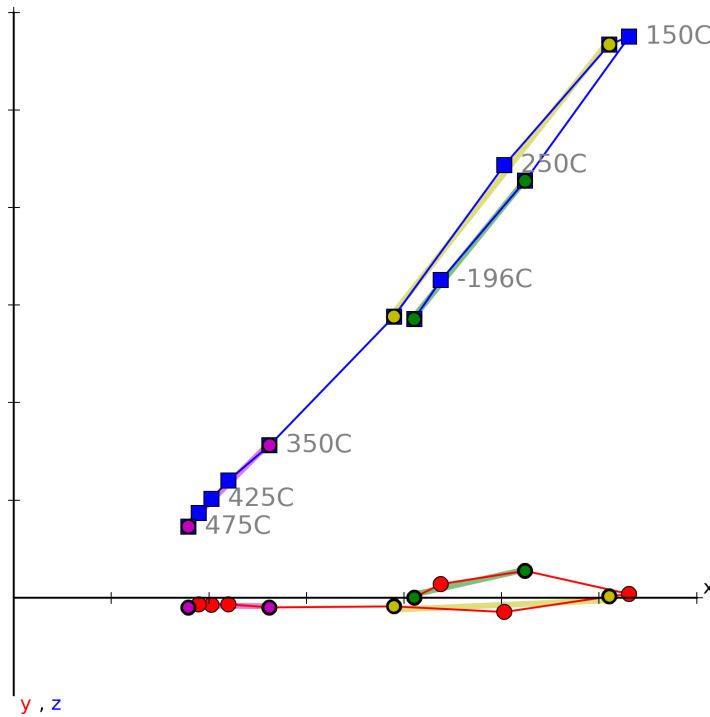


Figure 1: Zijderveld with 3 interpretations

specimen: Z35.1a

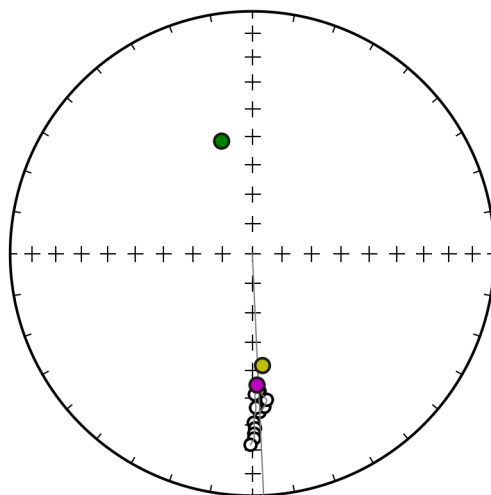


Figure 2: Equal Area plot of specimen data and interpretations

M/M_0

Z35.1a

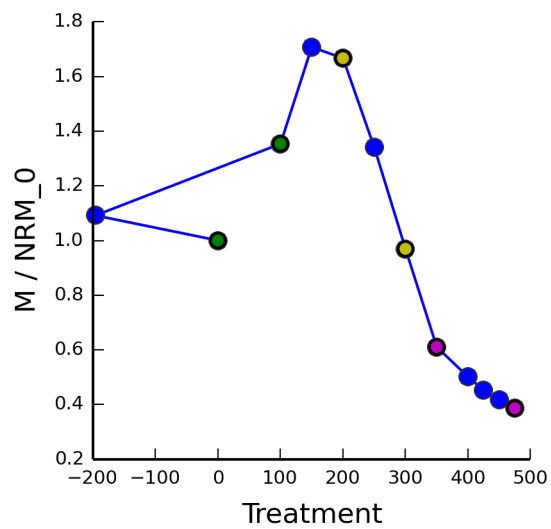
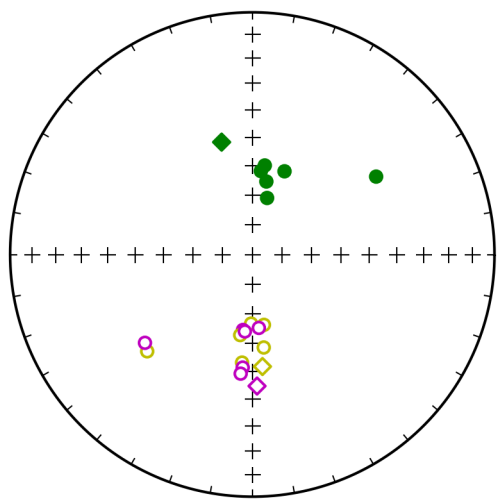


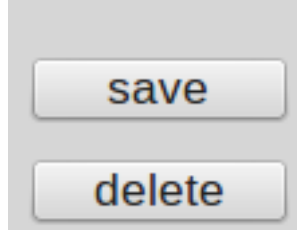
Figure 3: M/M_0

site: Z35



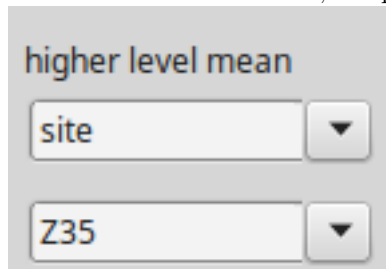
Deleting Specimen Interpretations

If you would like to delete a single interpretation select the one you wish to delete from the interpretation drop down box then click delete. Alternatively if you wish to clear all interpretations you may go to the menu option Analysis/“Clear all current interpretations”.

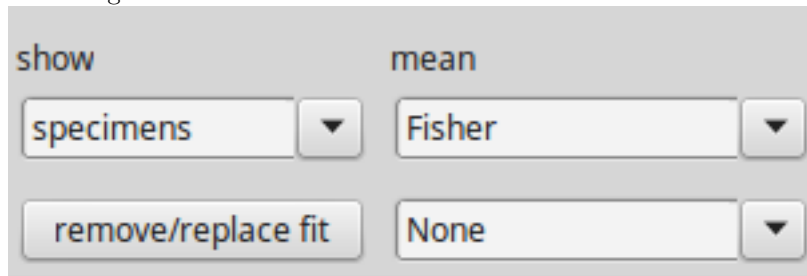


Higher Level Plots and Interpretation

The set of drop down boxes to the right of the interpretation data is there to determine what level you want to analyze in the higher level analysis options include: site, sample, location, and study. The drop down below this selects which of the available sites, samples, location, or studies you want to display.



You can then select how to group your data by using the drop down menu under the show header. You can select what kind of mean to take using the first drop down under the mean header. Which interpretations to use for the means can be selected under the second drop down menu. You can then use the remove/replace button to remove or replace the set of points belonging to the current specimen in the higher order mean.



You can view Fisher/Bingham statistics in the bottom left of the GUI.

Fisher statistics:

dec: 183.9

inc: -54.0

alpha95: 48.1

K: 1.0

R: 6.8791

n_lines: 21

n_planes: 0