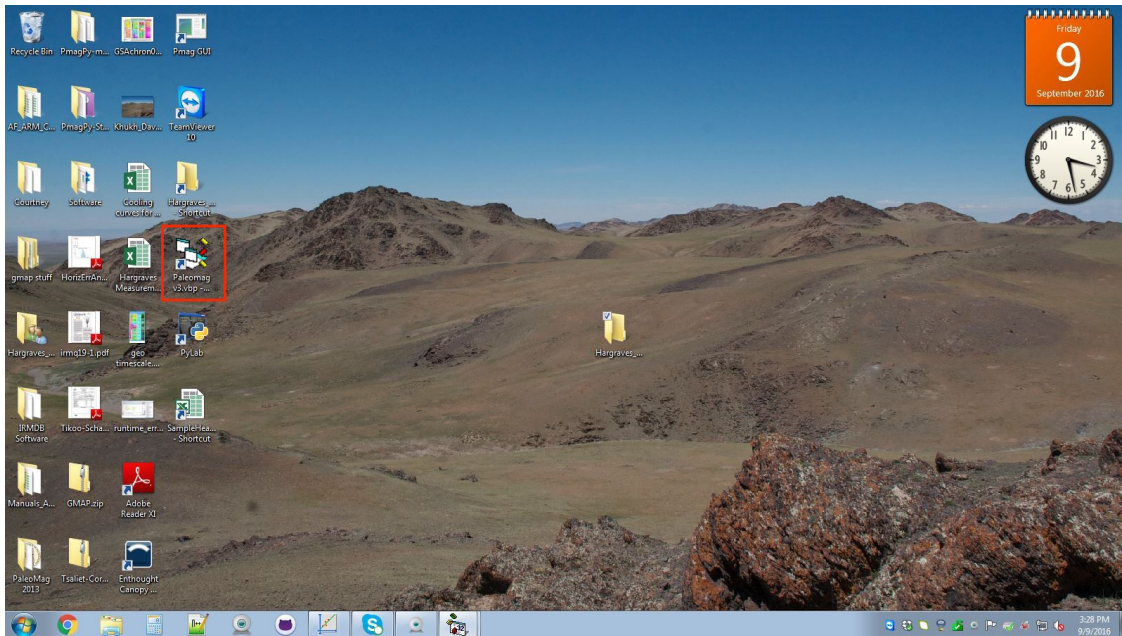
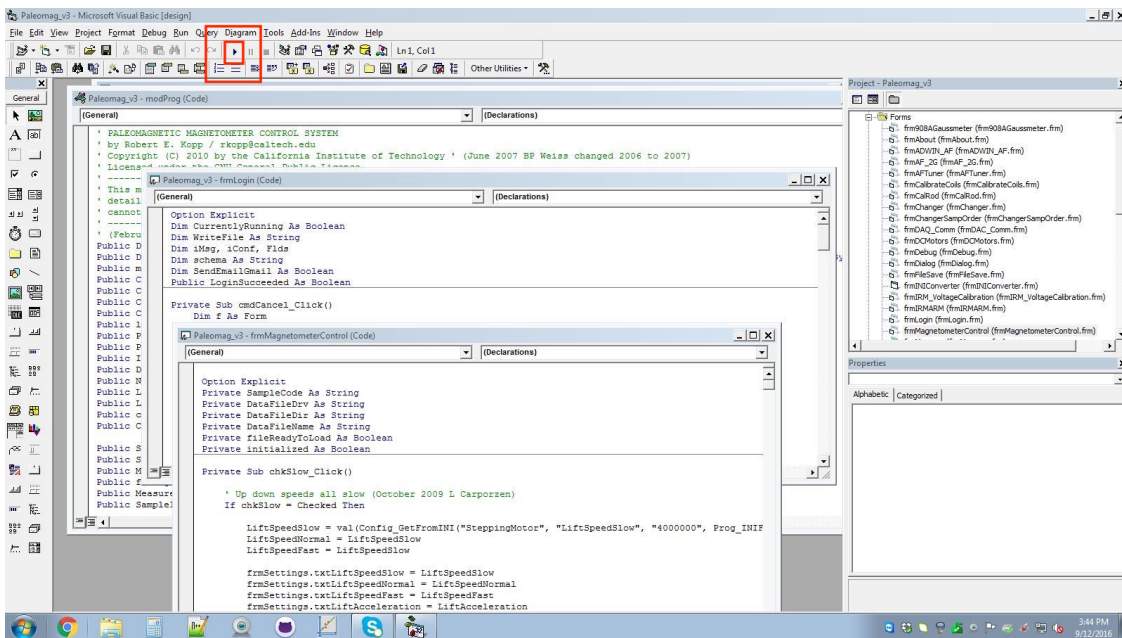


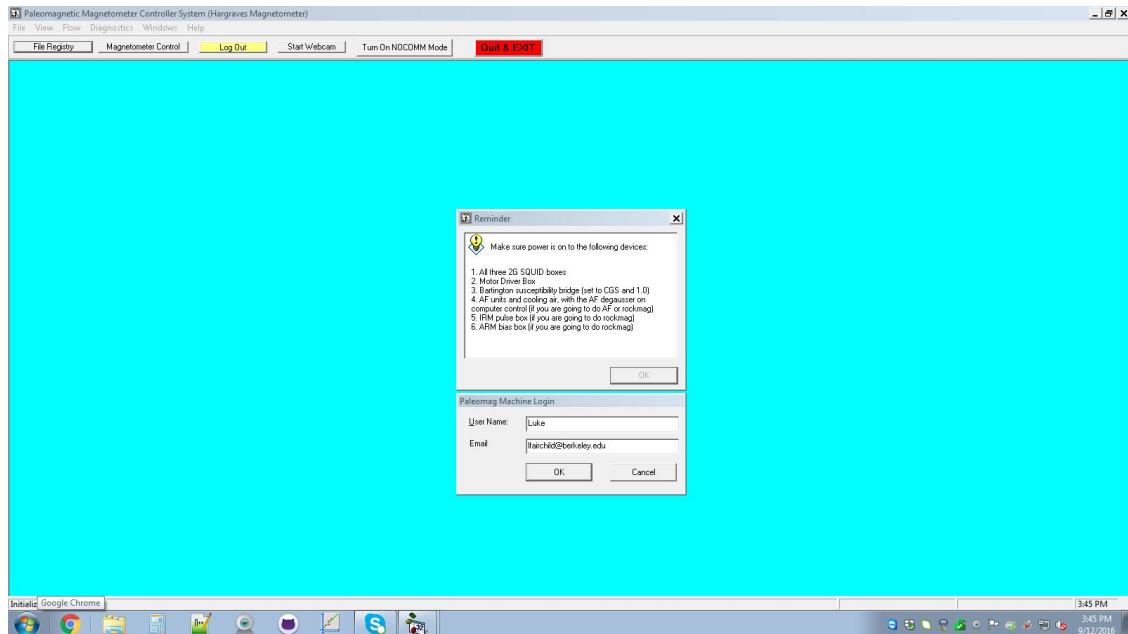
**Step 1.** Open the Visual Basic program (double click the circled icon on the desktop).



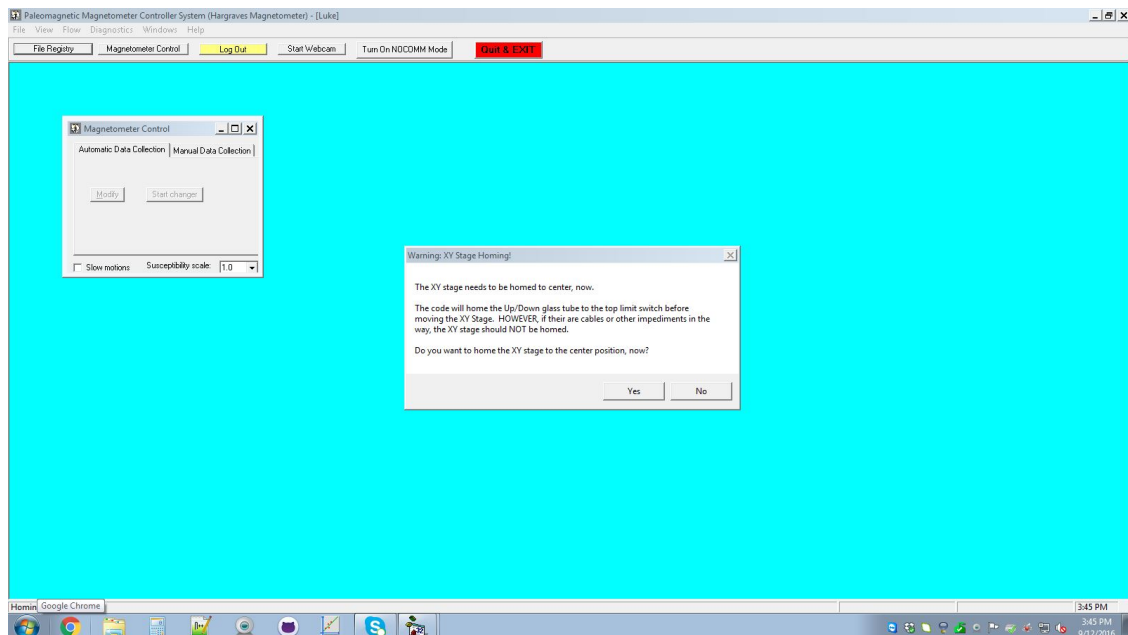
**Step 2.** Press the play icon to open the program interface.



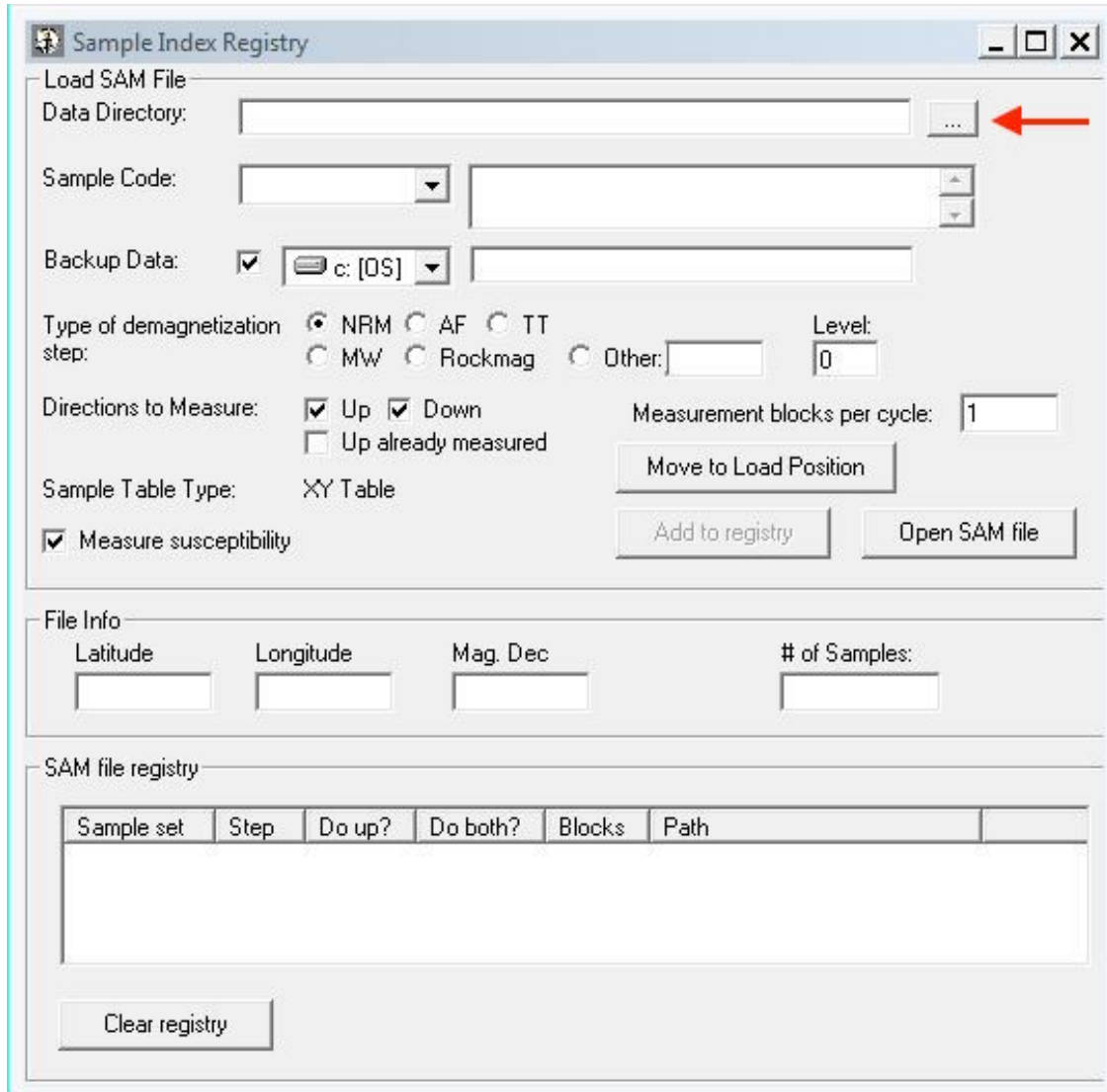
**Step 3.** Sign in with your name and email.



**Step 4.** The program will ask to home the XY stage to center—you can either choose to do this now (if your samples are already loaded on the tray) or click “No” to do it later.



**Step 5.** The Sample Index Registry window (see below) should open automatically. Click the button marked by the arrow to begin loading your data files into the registry.



The screenshot shows the 'Sample Index Registry' window. The 'Load SAM File' section contains the following fields and controls:

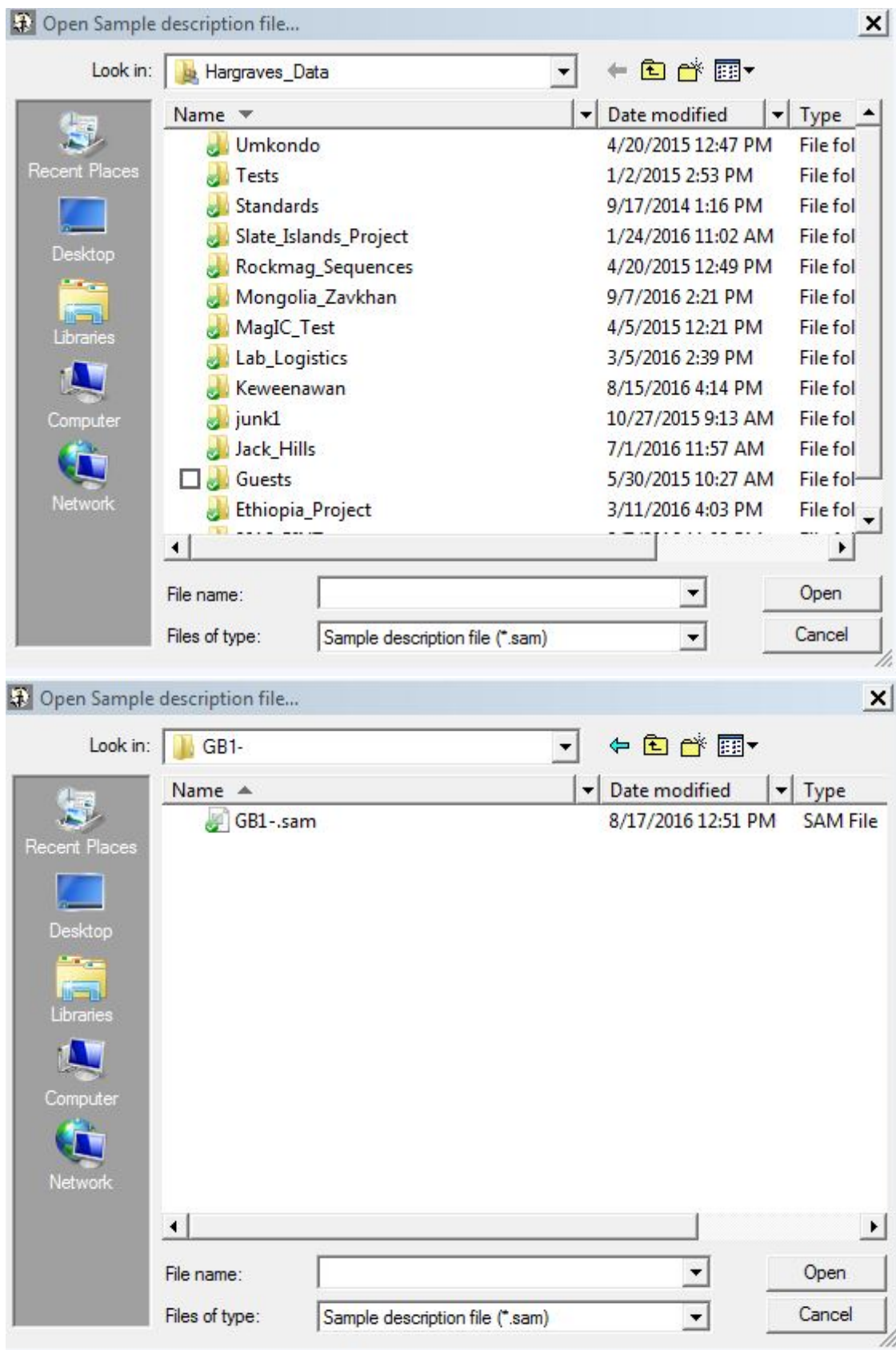
- Data Directory:** A text field with a browse button ('...') indicated by a red arrow.
- Sample Code:** A dropdown menu and a text field.
- Backup Data:** A checked checkbox, a drive dropdown (showing 'c: [OS]'), and a text field.
- Type of demagnetization step:** Radio buttons for NRM (selected), AF, TT, MW, Rockmag, and Other. A 'Level:' field with the value '0' is next to the 'Other' option.
- Directions to Measure:** Checkboxes for 'Up' (checked), 'Down' (checked), and 'Up already measured' (unchecked).
- Measurement blocks per cycle:** A text field with the value '1'.
- Sample Table Type:** A dropdown menu showing 'XY Table'.
- Buttons:** 'Move to Load Position', 'Add to registry', and 'Open SAM file'.
- Measure susceptibility:** A checked checkbox.

The 'File Info' section contains four text fields: 'Latitude', 'Longitude', 'Mag. Dec', and '# of Samples'.

The 'SAM file registry' section contains a table with the following columns: 'Sample set', 'Step', 'Do up?', 'Do both?', 'Blocks', and 'Path'. The table is currently empty.

A 'Clear registry' button is located at the bottom left of the window.

**Step 6.** In the Hargraves\_Data Dropbox folder, find the SAM file of the first site you want to load.



**Step 7.**

1. Uncheck “Backup Data”.
2. Specify the treatment step of the samples you are measuring. In the example below, samples have been thermally demagnetized (“TT”) to 200 °C.
3. Specify the orientations of samples you wish to measure. Both “Up” and “Down” should be measured when possible. If “Up” directions were measured previously and you are only measuring “Down”, uncheck “Up” and check “Up already measured”.
4. Specify whether you want to measure susceptibility.
5. Add the site to the registry.

The screenshot shows the 'Sample Index Registry' dialog box. Red numbers 1 through 5 are placed next to specific controls: 1. Next to the 'Backup Data' checkbox (which is unchecked). 2. Next to the 'Type of demagnetization step' radio buttons, where 'TT' is selected. 3. Next to the 'Directions to Measure' checkboxes, where both 'Up' and 'Down' are checked. 4. Next to the 'Measure susceptibility' checkbox (which is checked). 5. Next to the 'Add to registry' button.

**Sample Index Registry**

Load SAM File  
Data Directory: C:\Dropbox\Hargraves\_Data\Keweenawan\Gooseberry\

Sample Code: GB1- GB1-

Backup Data: ☐ c: [OS] c:\Dropbox\Hargraves\_Data\Keweenawan\

Type of demagnetization step: ☐ NRM ☐ AF ☒ TT ☐ MW ☐ Rockmag ☐ Other: Level: 200

Directions to Measure: ☒ Up ☒ Down ☐ Up already measured Measurement blocks per cycle: 1

Sample Table Type: XY Table

☒ Measure susceptibility

Move to Load Position

Add to registry Open SAM file

**File Info**

Latitude	Longitude	Mag. Dec	# of Samples:
47.2	-91.5	0	8

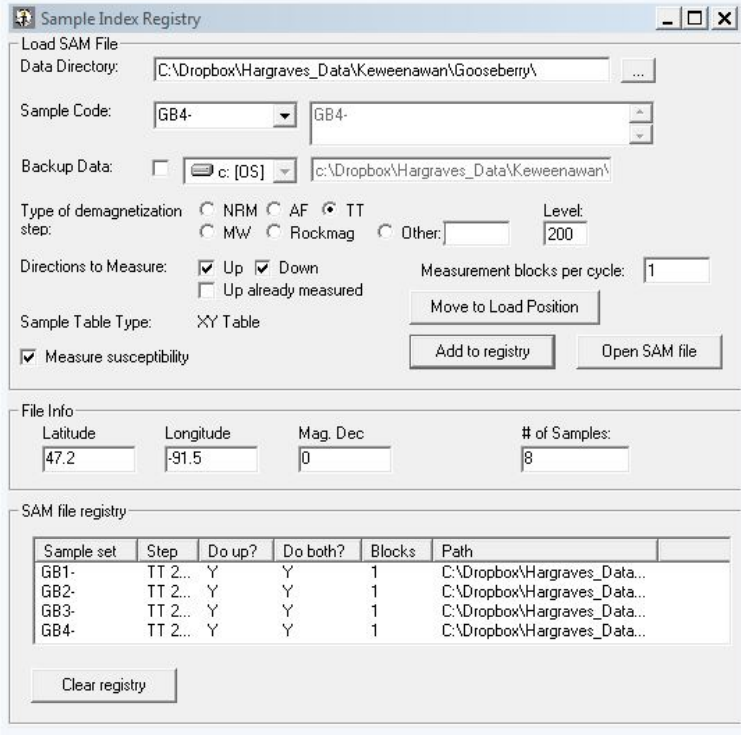
**SAM file registry**

Sample set	Step	Do up?	Do both?	Blocks	Path

Clear registry



**Step 8.** Repeat step 7 for all sites and fill the registry.



The **Sample Index Registry** window is used to configure data collection parameters. It includes fields for the Data Directory, Sample Code, Backup Data, and demagnetization settings. The File Info section shows Latitude (47.2), Longitude (-91.5), Mag. Dec (0), and # of Samples (8). The SAM file registry table lists sample sets GB1- through GB4- with their respective steps, directions, and paths.

**Load SAM File**  
Data Directory: C:\Dropbox\Hargraves\_Data\Keweenaw\Gooseberry\

Sample Code: GB4- GB4-

Backup Data: ☐ c: [OS] c:\Dropbox\Hargraves\_Data\Keweenaw\

Type of demagnetization step: ☐ NRM ☐ AF ☒ TT ☐ MW ☐ Rockmag ☐ Other: Level: 200

Directions to Measure: ☒ Up ☒ Down ☐ Up already measured Measurement blocks per cycle: 1

Sample Table Type: XY Table

☒ Measure susceptibility

Buttons: Move to Load Position, Add to registry, Open SAM file

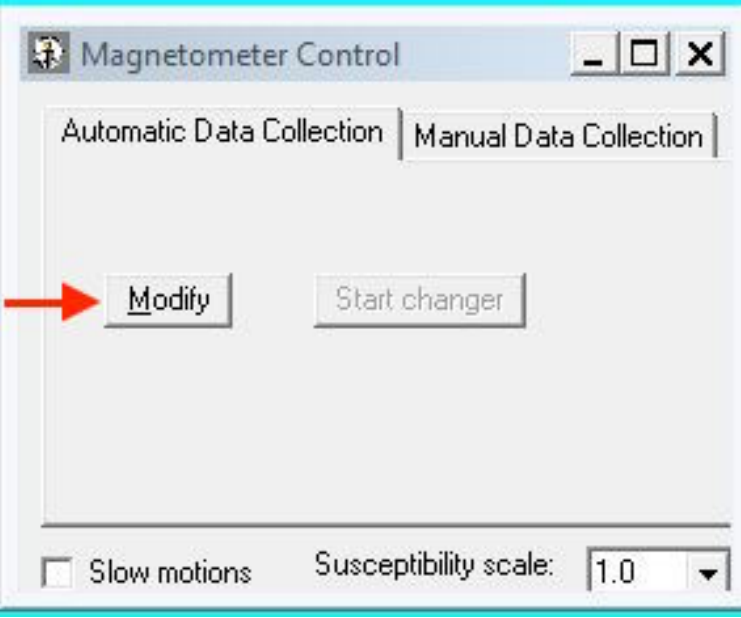
**File Info**  
Latitude: 47.2 Longitude: -91.5 Mag. Dec: 0 # of Samples: 8

**SAM file registry**

Sample set	Step	Do up?	Do both?	Blocks	Path
GB1-	TT 2...	Y	Y	1	C:\Dropbox\Hargraves_Data...
GB2-	TT 2...	Y	Y	1	C:\Dropbox\Hargraves_Data...
GB3-	TT 2...	Y	Y	1	C:\Dropbox\Hargraves_Data...
GB4-	TT 2...	Y	Y	1	C:\Dropbox\Hargraves_Data...

Clear registry

**Step 9.** In the Magnetometer Control window, click “Modify”.



The **Magnetometer Control** window has two tabs: Automatic Data Collection and Manual Data Collection. The Manual Data Collection tab is active, showing a Modify button and a Start changer button. A red arrow points to the Modify button. At the bottom, there is a checkbox for Slow motions and a Susceptibility scale set to 1.0.

**Magnetometer Control**

Automatic Data Collection | Manual Data Collection

Modify Start changer

☐ Slow motions Susceptibility scale: 1.0

**Step 10.** Specify the position (hole number) of the first sample. Click “Add to list”. This will assign positions on the tray for all the samples in the registry in the order that they were loaded (starting from the initial position). Click “View new sample list” and check that the positions of the samples on the tray are correct.

**Sample Settings**

Position of first sample:

From file:

Load Order  
☒ Ascending ☐ Descending

Reload position  
☒ Return to start ☐ Leave at end

Final position  
☒ Return to start ☐ Leave at end

Multiple holder measurements  
☒ Repeat (weak samples) ☐ Skip (strong samples)

AF Holder  
☐ AF Holder before measuring

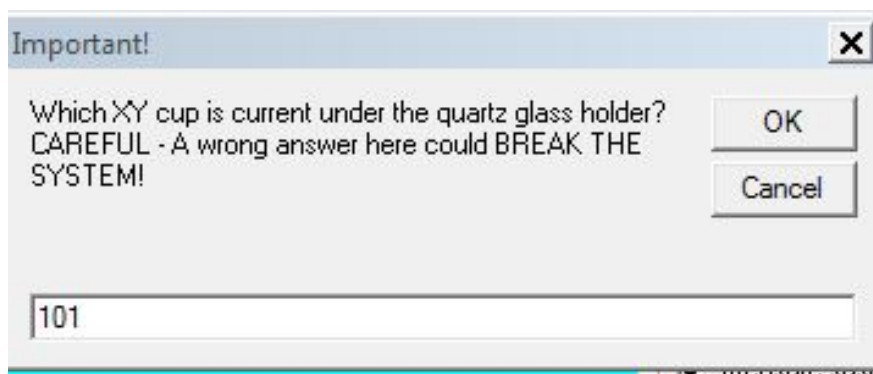
Measure Holder  
☒ Measure holder every  samples

**Hole Sample List - New Sample Set**

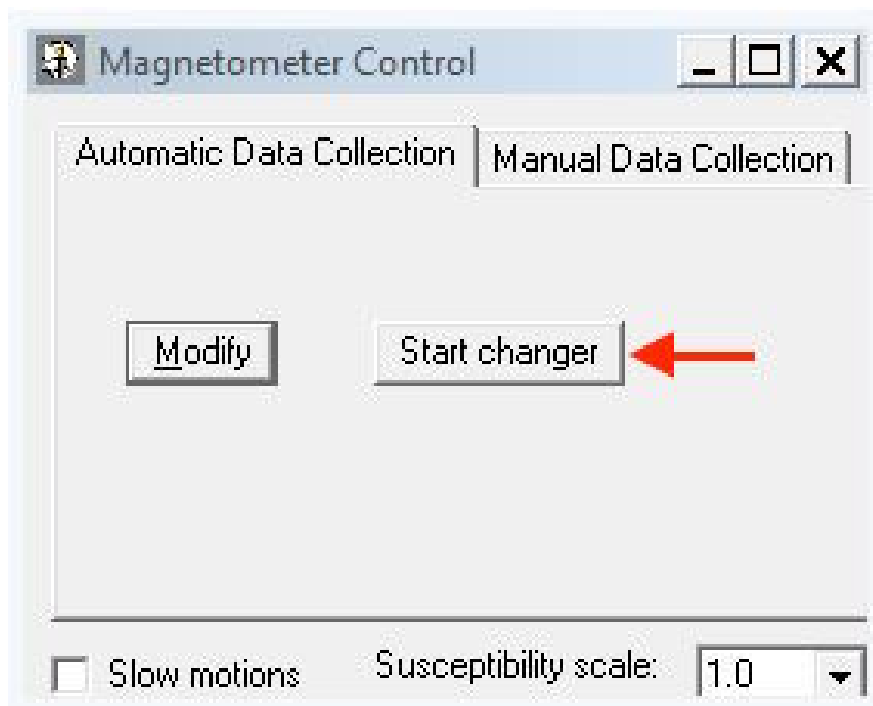
Hole	Sample	Hole	Sample	Hole	Sample
1	GB1-1a	47		93	
2	GB1-2a	48		94	
3	GB1-3a	49		95	
4	GB1-4a	50		96	
5	GB1-5a	51		97	
6	GB1-6a	52		98	
7	GB1-7a	53		99	
8	GB1-8a	54		100	
9	GB2-1a	55			
10	GB2-2a	56			
11	GB2-3a	57			
12	GB2-4a	58			
13	GB2-5a	59			
14	GB2-6a	60			
15	GB2-7a	61			
16	GB2-8a	62			
17	GB3-1a	63			
18	GB3-2a	64			
19	GB3-3a	65			
20	GB3-4a	66			
21	GB3-5a	67			
22	GB3-6a	68			
23	GB3-7a	69			
24	GB3-8a	70			
25	GB4-1a	71			
26	GB4-2a	72			
27	GB4-3a	73			
28	GB4-4a	74			
29	GB4-5a	75			
30	GB4-6a	76			
31	GB4-7a	77			
32	GB4-8a	78			
33		79			

Sample order  
☒ Ascending ☐ Descending

**Step 11.** If you chose not to home the XY stage in Step 4, the system will ask you to do this now. If you have started the program from scratch (i.e. you did not simply log off a different user and log back in), the system will confirm the position of the glass holder once the XY stage homes to center. Check to make sure the glass holder is positioned over the hole in the tray (cup number 46). If it is, enter 46 and click Okay. If it isn't, something is wrong.



**Step 11.** Click "Start changer" to begin your measurements!





## Miscellaneous Tips

### SQuID jumps

The occasional SQuID jump is not a cause for concern—the magnetometer will remeasure samples up to three times before giving up (you will receive an email notification for this). For some samples, however, frequent SQuID jumps might be more of a nuisance, especially if multiple automatic remeasurements by the magnetometer don't seem to be resolving the issue. SQuID jumps may be improved or eliminated by slowing down the up/down and turning motors. This slows down the measurement process and decreases the chance of a flux jump for strongly magnetic samples.

In the program window, go to **View→Settings**. Under the **DC Motors (1)** tab, lower the **Lift speed slow** and **Turning speed** values. To maintain reasonable operating speeds, do not decrease the values to a lower magnitude. For example, start by lowering **Lift speed slow** from  $3 \times 10^7$  to  $2 \times 10^7$  and see if the SQuID jumps improve.

### Sample gets stuck on descent

If you receive an “unacceptable slop” notification, it is most likely due to a sample that has been caught on the edge of the tray as it is being lowered into the magnetometer. Go to **Diagnostics→DC Motors** and click **Home to Top**. Unless it has dropped through the magnetometer, quickly adjust the sample on the holder before it descends again. Be sure to “Resume” the run.