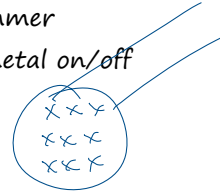


nn' update

Thursday, May 16, 2024 1:14 PM

1) Report on degaussing

- Yusuf will do the data analysis and prepare this report during the summer
 - Andrew and Cory helped Yusuf acquire 4 datasets: coil on/off x mu-metal on/off
- Scanned 9 lines along the inside of the coil
Also scanned the region inside and outside of the end of the coil with a mu-metal endcap on/off/degaussed



Raw data: <https://drive.google.com/drive/folders/1Xgc3hMyDph7r9HrnxitFbtAxkGNktsDT?usp=sharing>

2) Calculated vs measured resistance of the coil

- From Yusuf: 40 ohm vs 26 ohm - short circuit?
- /Will verify resistance per length by measuring resistance of entire spool

3) Update on the wire winding preparation for the magnet 1

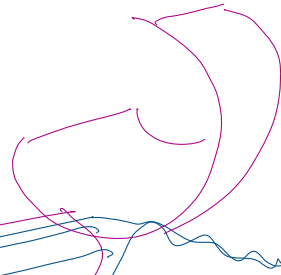
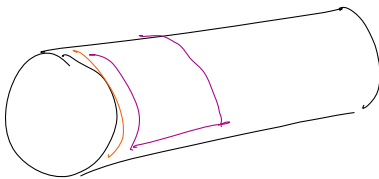
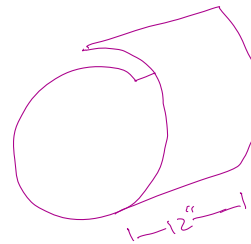
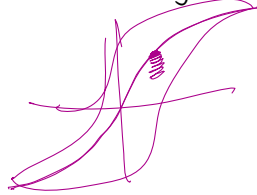
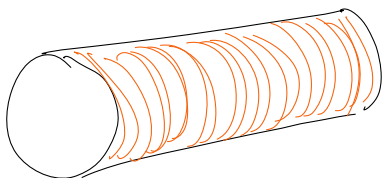
- Karl has designed brackets to mount chamber to the lathe; in fabrication
- Will use softer guide that does not scratch off the enamel
- Plan is to measure total resistance of entire spool periodically while winding to ensure that there are no shorts



4) Draft of the scheme of degaussing wiring of the magnet after full assembly of mu-metal

- Magnet can either be degaussed at atmosphere or in vacuum (if feedthroughs)
- Degaussing will only need to be performed after significant changes in the ambient magnetic field (probably only once)

5) Assembly of magnet:



1) Old calculations AWG18, loose windings, two layers:

$$I = ((30 \text{ Gs} / \mu_0) * 1.1 \text{ mm} = 2.62 \text{ A}) / 2 = 1.3 \text{ A}$$

$$N = (2\text{m} / 1.1\text{mm} = 1818) * 2 = 3636$$

$$R = (N * 8\text{in} * \pi * 20.95\text{mohm/m} = 24.3 \text{ ohm}) * 2 = 48 \text{ ohm}$$

$$V = I * R = 63.85 \text{ V}$$

$$P = (V * I = 156.1 \text{ W}) / 2 = 78 \text{ W}$$

$$L = (N * 8\text{in} * \pi = 1160 \text{ m} = 3807 \text{ ft}) * 2 = 7614 \text{ ft}$$