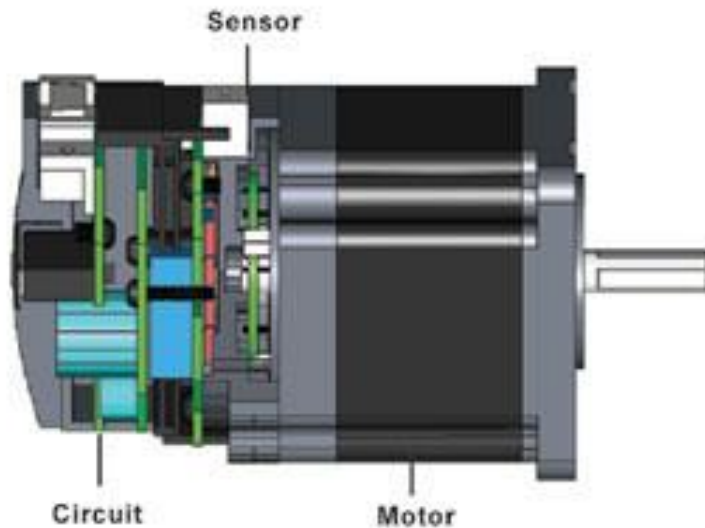


# Things left to do for Fermi

Carlos Ramirez

# EIO Motor

- Yesterday, we discovered that the stepper motor for the EIO must have the controller attached to the motor for it to operate, thus we cannot use this particular stepper.



## 3.2 Installation

This section covers the environment and method of installing the device, along with load installation.

### ■ Location for Installation

The device is designed and manufactured for installation in equipment.

Install it in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions:

- Inside an enclosure that is installed indoors (provide vent holes)
- Operating ambient temperature 0°C to +40°C (+32°F to +104°F) (non-freezing)
- Operating ambient humidity 85%, maximum (no condensation)
- Area that is free from an explosive nature or toxic gas (such as sulfuric gas) or liquid
- Area not exposed to direct sun
- Area free of an excessive amount of dust, iron particles or the like
- Area not subject to splashing water (storms, water droplets), oil (oil droplets) or other liquids
- Area free of excessive salt
- Area not subject to continuous vibration or excessive shocks
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)
- Area free of radioactive materials, magnetic fields or vacuum
- 1000 meters (3300 ft.) or lower above sea level

# EIO Motor

- We can replace this stepper with another stepper of the same physical size/mounting arrangement.
  - Same separation between mounting holes
  - Same output shaft size
  - Comparable torque
  - Proper step resolution
  - Controller that can be mounted remotely
  - Built in hard position readout
- We determined from Josh's calibration data that with the current stepper motor:
  - 0.01 rev -> ~30 MHz of frequency change
  - Dustin said we need an order of magnitude better resolution.
  - 0.001 rev -> ~3 MHz of frequency change

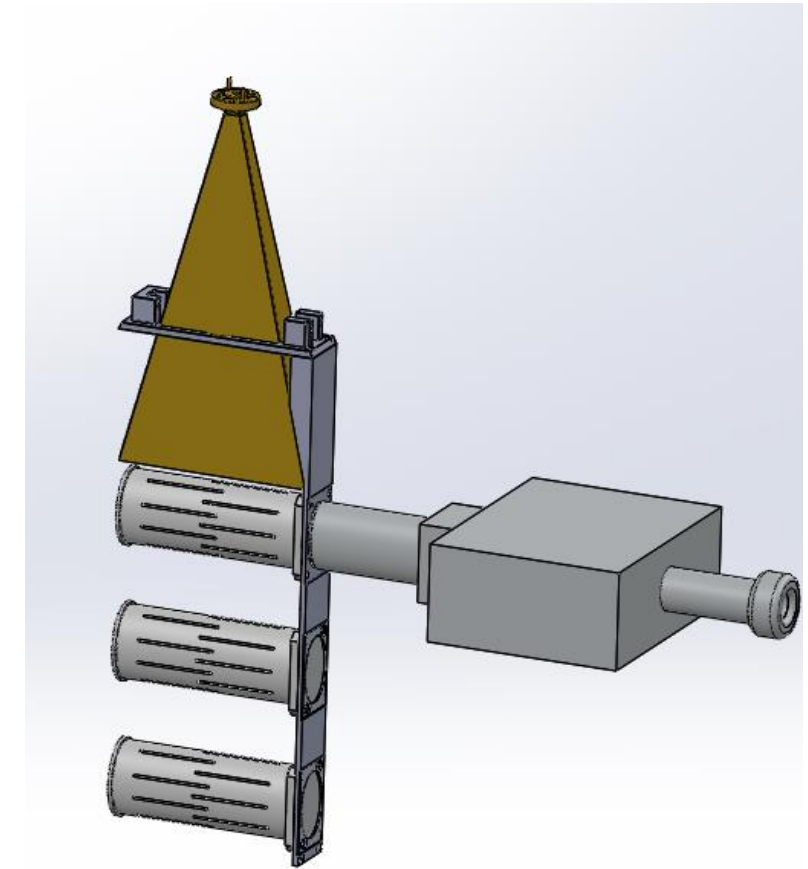
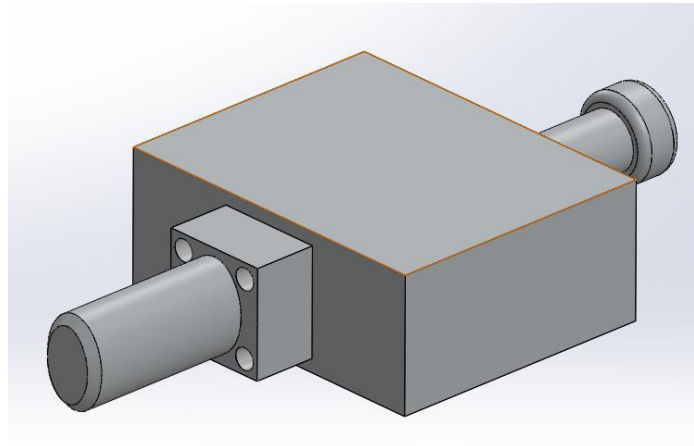
Thus the new stepper needs to have 'milli-revolution' resolution.

This means that the smallest step size needs to be less than or equal to:  
 $360\text{deg.} / 1000\text{ steps} = 0.360\text{ deg. per step}$

Conveniently, this is a very standard step size for stepper motors.

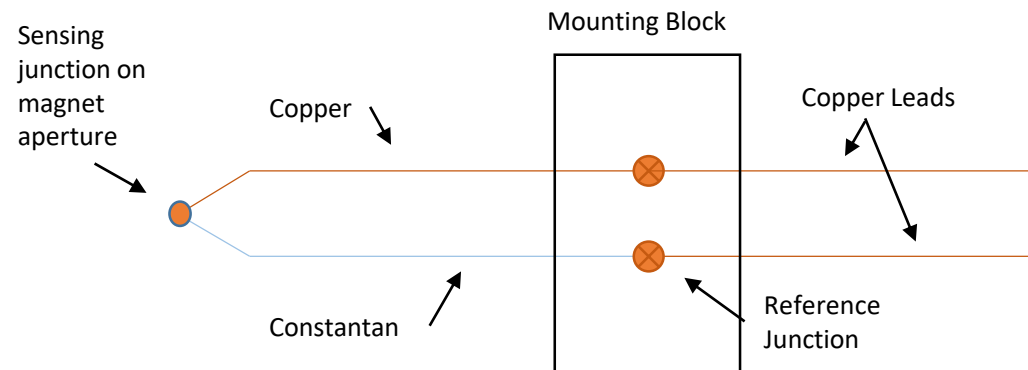
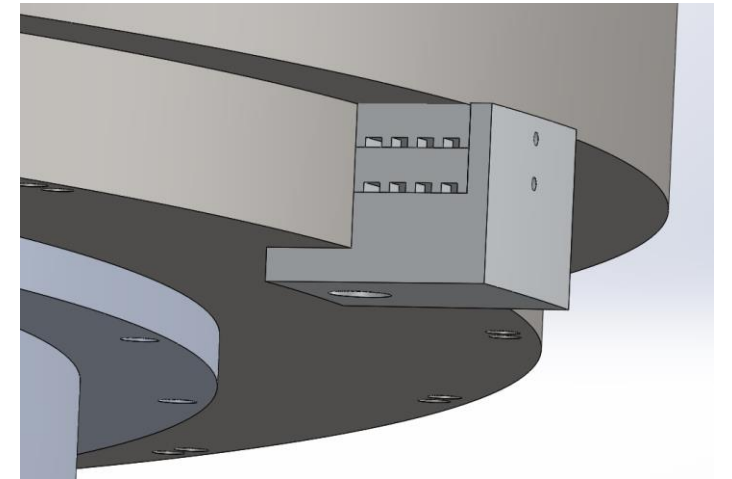
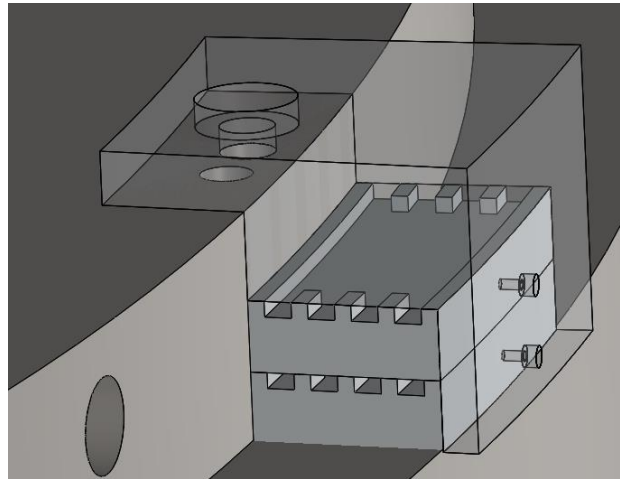
# Stick Alignment

- We want to know how far the lifter table needs to move to put each cup in the beamline.
- Traditionally, this is done by a surveyor, but this is expensive and will also be done at Fermi, but the NMSU engineer designing the table needs these dimensions to finalize his design, pre-Fermi.
- Idea:
  - The 'indexer' is inserted into one of the magnet beam apertures.
  - As the stick is lowered into position, the 'indexer' will slide into each target cup, locating the stick in the correct positions.
  - Then we can measure the distance between the stick flange and a reference point (top of fridge).
  - This gives a good idea of the distances the stick needs to travel. Then the Fermi surveyors can determine the precise location.



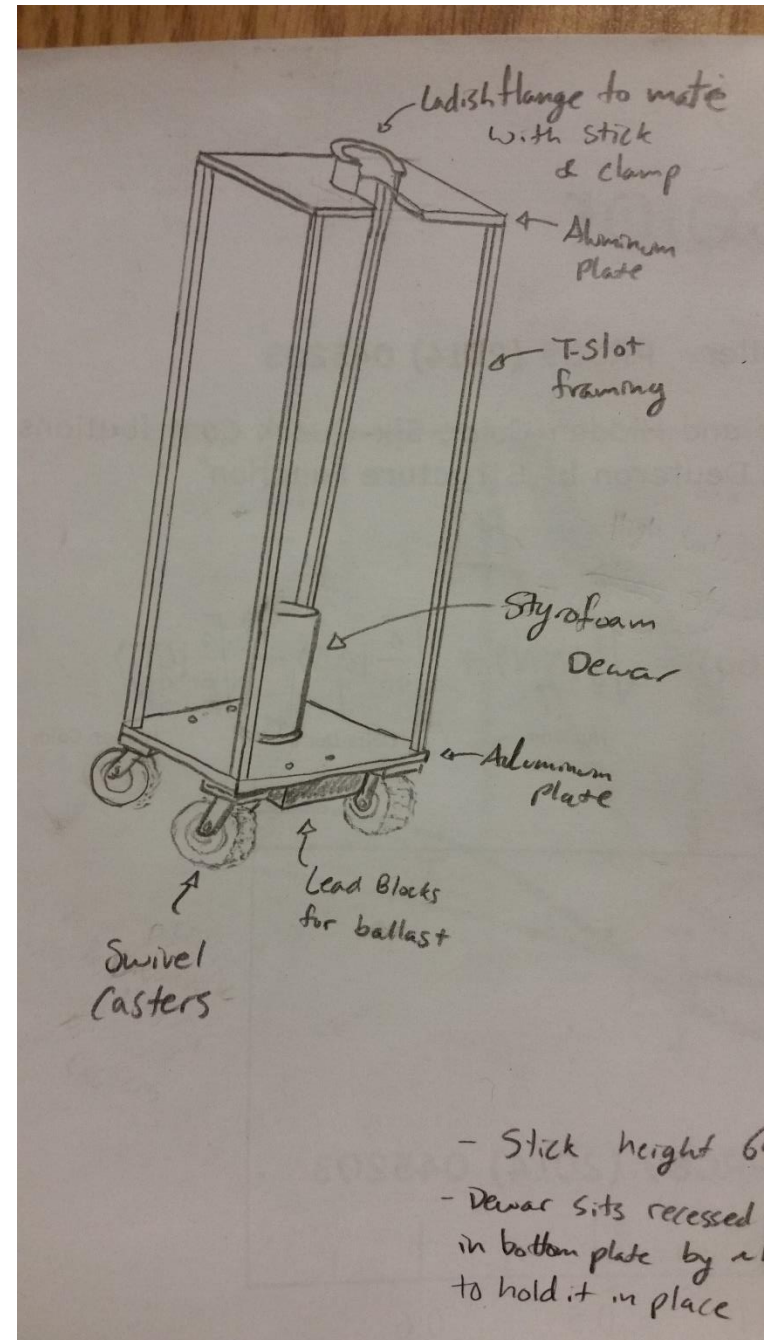
# Magnet Thermocouple Mount

- Serves as a mount for the thermocouple wires and also the reference junctions.



# Stick Holder

- Movable rack for the stick to move it from where it is loaded, to the target cave.
- Want to use some of that T-Slot aluminum stock in B28 next to where Zulkaida sits.



# Removable Target Cups

- New Kel-F target cups that will mount to existing target insert ladder.
- Idea is to be able to load cups with material on the bench and place into storage. Then easily mount the pre-loaded cups onto the insert.
- Eliminates current cumbersome loading procedure.

