**EE/CprE/SE 492 Weekly Report**

**3/16 - 3/30**

**Group number: 38**

**Macro and Microscopic Ion Trap Junction Prototype for Quantum Computing**

**Client/Advisors: Durga Paudyal, Gavin Nop, John Smith**

**Ezra Manus, Robert Laskey, Calvin Mitchell, Andrew Wilken**

**Weekly Summary:**

Over the past two weeks, we have been working to implement the first linear trap. We've setup and tested the individual components

**Past week accomplishments:**

- Finalized design specs and formed a parts list
    - We've acquired parts for early testing, and more are coming.
- Aquired parts:
    - High voltage coil transformer: 110-120V, 50-60Hz AC input and up to 2kV 50-60Hz output. Actual requirement for the system ***should*** be 500V, but the extra headroom has been encouraged by our client due to the lack of knowledge or expectation of how our system is going to work.
    - Variac/Voltage regulator: Needed to control the output of the transformer; we have found options for this already and believe we can acquire one easily.
- Part to-do's:
    - Design and print parts for constructing the system and mounting the electrodes: currently waiting on our first round of testing to complete so we know what we need in terms of mounting and electrical isolation

- Copper plates for electrodes: get copper sheets from ETG (ETG has confirmed they have these available) and utilize campus facilities to cut the copper into electrodes at the sizes we need
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**Work breakdown table:**

| Name | Individual contributions | Weekly hours | Cumulative hours |
|---|---|---|---|
| Robert Laskey | Worked with ETG to acquire parts, researched transformer technology and came up with preliminary wiring techniques for our system | 6 | 12 |
| Ezra Manus | Researched proper techniques for working with high voltage transformers while also looking into how to use a variac. | 6 | 12 |
| Andrew Wilken | Researched sources for dealing with high voltage charged electrodes and grounding techniques to stay safe during testing. | 6 | 12 |
| Calvin Mitchell | Researched safe handling of high voltage transformers and procured a transformer. | 6 | 12 |

**Plans for the upcoming week:**

Since our xfmr has arrived, we plan to go into ETG on Monday to pick up the remaining parts (Variac and copper plates). From there, we plan to start building during the week. With us having never built a prototype like this, it is uncertain how long it will take to construct our novel trap. Before building, we are going to need to experiment with the xfmr to make sure we know how to operate it safely.