7/18/22

Grating System Setup

The goal of this activity was to setup the grating we had in the lab to see if it would work for our SQL characterization purposes and to get an alignment going for the balanced detector (the new one that finally came in)

- Tried to get grating experimentally setup with rough alignment and was not initially seeing any position change with different wavelengths when changing via RIO laser

- Problem was that the incident angle was not enough and I was just observing the transmitted beam (which makes sense because I could see the grating lines)

- Fixed this issue by MINIMIZING the 0th order beam (the one I was originally observing and maximizing) and this maximized the reflected beam of maximum order

- The reflected beam was at a very large angle from the incident beam, and I was able to find it with a detector card and then verify that the position changed as the wavelength was manually changed.

- I was also able to verify that it did not matter from which side of the grating the incident beam hit.

- Then I oriented the system to reflect the beam down the table where there was the most pathlength distance to split the beams.

- The distance between the wavelength positions was found to be much smaller than originally calculated. However, I do not know that the specs for this particular grating are accurate
    - At about 73 cm away, the positions were found to be about 2 cm apart

- Luckily, there was enough space on the table to separate the signal and idler successfully

- The goal was then to design and build a setup that would allow for separation and also a way to math pathlengths exactly
    - The space between the wavelengths was too small to reflect the beams out at the same point, which required a more complicated setup than originally designed



Char. of SQL Grating Setup
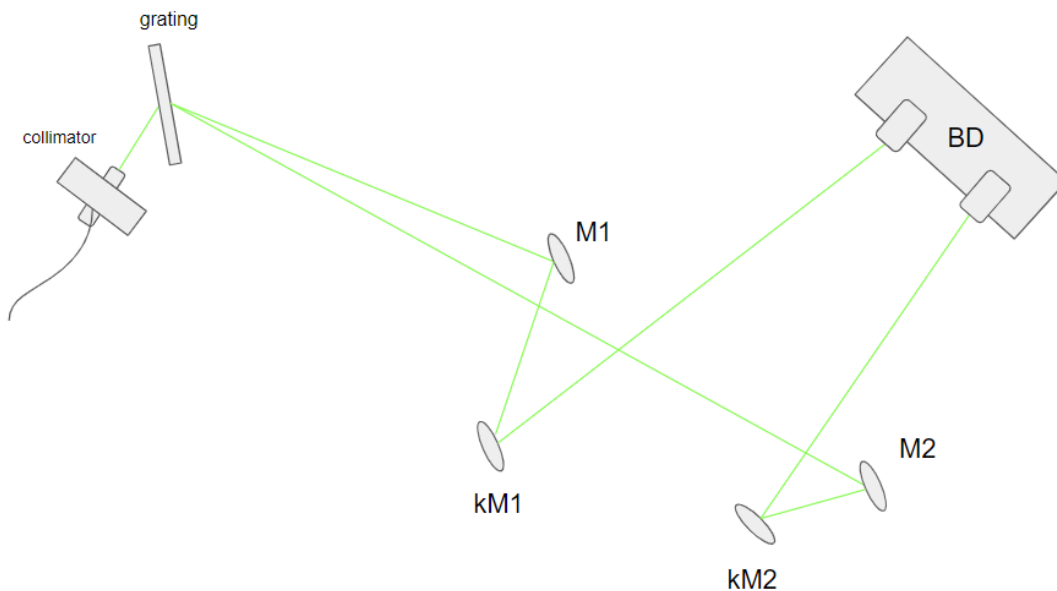
- used string to try and match pathlength, adjusting the post mount positions as needed

  - Got pathlengths matched within 5 mm uncertainty

- I anticipate needing a translation stage to make these path lengths match well enough for our purposes

Squeeze Light Setup Clarification

- Signal from the PD (post-filtered) will go into -B port of the Stabilizer

- Output of the Stabilizer goes both to the oscilloscope and to the RIO for the feedback and adjustments decided by the stabilizer

- error signal output of the stabilizer goes to the oscilloscope

Magnetometer Updated Schematic

Updated Magnetometer Setup
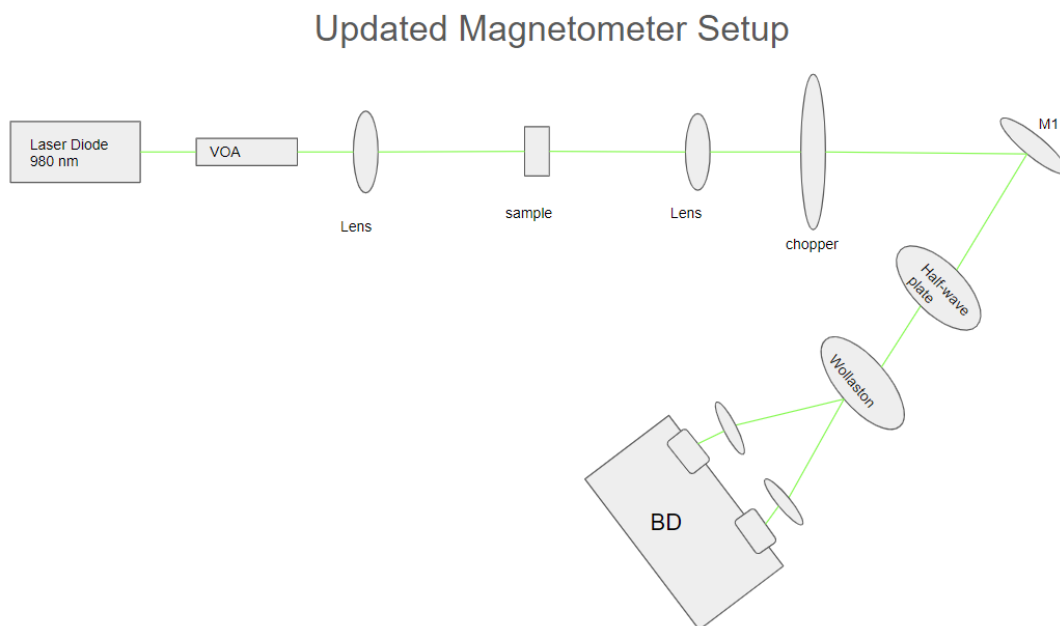
Tomorrow Goals

- SQL polarization tuning and resonance finding

- procedure for char. of SQL

- look over manual for new PDB210C

- Start setup for monitoring reflected beam from dichroic in UCNP which will replace physical measurements between powersweeps

- SQL theory

  - What is the measurement that I want to see from the SQL system