

With the lens, the laser current was set to be the same, so there are not two degrees of freedom that affect the wavelength: just temperature (not current) affects it. Legend shows the power received at the photodetector. In the beginning, I did not think about this so during the no lens measurements, I changed the current from 110 to 120 to 140 mA for certain cases. Where the dip occurs at the same temperature is where the current was set to be the same.

The data for the lens has the same applied current of 140 mA. How this experiment should have been done is by maintaining a constant current and purely changing the power setting with the waveplate, which isolates the effect of laser power (without current change effects). This will also affect dip depth.



With Lens					
	x (microns)	y (microns)	Distance from main mirror (m)	JamMt expectation (micrometers)	Difference (microns)
Beam size before vapor cell	870.5	873.2	0.11	857.062	-13.438
Beam size after vapor cell	184.9	181.7	0.2	171.6	-13.3
Beam size at photodetector	130.5	134.3	0.22	130.676	0.176
Without Lens					
	x (micrometers)	y (micrometers)	Distance from main mirror (m)	JamMt expectation (micrometers)	Difference (microns)
Beam size before vapor cell	1408	1412.4	0.11	1393.964	14.036
Beam size after vapor cell	1482.3	1497.5	0.2	1477.152	5.148
Beam size at photodetector	1501	1516.8	0.22	1495.99	5.01