

Day	Spectrometer	Spectral Line	$\theta_{\text{left}} (^{\circ})$	$\theta_{\text{right}} (^{\circ})$	$\theta_{\text{average}} (^{\circ})$	$d \text{ (nm)}$	%Diff (w/my d)	%Diff (w/d <sub>calc</sub> )	$\lambda_{\text{obs}} \text{ (nm)}$	%Diff
Wednesday	A	Violet - H $\gamma$	15.3	15.4	15.4				446.5	-2.9%
		Blue - H $\beta$	17.0	17.4	17.2				498.8	-2.6%
		Red - H $\alpha$	23.5	24.0	23.8				679.3	-3.5%
		Crappy $\theta_{Na}$ Yellow - Na	20.4	20.5	20.5	1686.7	-2.8%	-4.2%		
Thursday	A	Violet - H $\gamma$	15.6	15.4	15.5				435.5	-0.4%
		Blue - H $\beta$	17.4	17.4	17.4				487.3	-0.3%
		Red - H $\alpha$	23.9	23.9	23.9				660.2	-0.6%
		Yellow - Na	21.2	21.2	21.2	1629.6	0.7%	-0.8%		
Miller <small>Data Collected 8-May-2024</small>	A	Violet - H $\gamma$	15.3	15.4	15.3				433.6	0.1%
		Blue - H $\beta$	17.1	17.3	17.2				485.2	0.2%
		Red - H $\alpha$	23.5	23.6	23.6				655.5	0.1%
		Yellow - Na	21.2	20.9	21.1	1640.7	0.0%	-1.5%		
Tuesday	B	Violet - H $\gamma$	16.1	14.6	15.4				434.3	-0.1%
		Blue - H $\beta$	18.1	16.6	17.4				489.3	-0.7%
		Red - H $\alpha$	24.4	22.9	23.7				658.2	-0.3%
		Yellow - Na	21.5	20.6	21.1	1640.7	-1.3%	-1.5%		
Wednesday	B	Violet - H $\gamma$	16.3	15.0	15.7				434.7	-0.2%
		Blue - H $\beta$	18.2	17.2	17.7				489.9	-0.8%
		Red - H $\alpha$	24.6	23.5	24.1				656.7	-0.1%
		Yellow - Na	22.0	20.9	21.5	1611.5	0.4%	0.3%		
Thursday	B	Violet - H $\gamma$	16.2	14.9	15.6				434.9	-0.2%
		Blue - H $\beta$	18.1	17.0	17.6				489.2	-0.7%
		Red - H $\alpha$	24.4	23.5	24.0				658.6	-0.4%
		Yellow - Na	21.9	20.7	21.3	1622.3	-0.2%	-0.4%		
Miller <small>Blue fringe on m=0</small>	B	Violet - H $\gamma$	16.3	14.9	15.6				435.3	-0.3%
		Blue - H $\beta$	18.2	16.8	17.5				486.7	-0.2%
		Red - H $\alpha$	24.6	23.2	23.9				655.8	0.0%
		Yellow - Na	21.8	20.9	21.4	1618.7	0.0%	-0.1%		
Wednesday	C	Violet - H $\gamma$	16.5	13.6	15.1				425.1	2.0%
		Blue - H $\beta$	18.3	16.1	17.2				484.1	0.4%
		Red - H $\alpha$	26.0	21.9	24.0				664.5	-1.3%
		Yellow - Na	22.1	20.1	21.1	1637.0	1.1%	-1.3%		
Thursday	C	Violet - H $\gamma$	17.0	14.4	15.7				440.0	-1.4%
		Blue - H $\beta$	18.8	16.1	17.4				486.9	-0.2%
		Red - H $\alpha$	24.8	22.5	23.7				652.2	0.6%
		Yellow - Na	22.3	20.3	21.3	1625.9	1.8%	-0.6%		
Miller	C	Violet - H $\gamma$	16.4	14.1	15.3				435.5	-0.4%
		Blue - H $\beta$	18.3	15.9	17.1				486.8	-0.2%
		Red - H $\alpha$	24.6	22.2	23.4				657.6	-0.2%
		Yellow - Na	22.1	19.6	20.9	1655.7	0.0%	-2.4%		

		hc =	1240	eV·nm
		$\lambda$ (nm)	Lyman	Balmer
n	E <sub>n</sub> (eV)			$\theta$ (actual)
1	-13.610	121.5		
2	-3.403	102.5	656.0	23.9
3	-1.512	97.2	485.9	17.5
4	-0.851	94.9	433.9	15.6
5	-0.544		410.0	14.7
6	-0.378			
		Na (nm) =	589.3	21.4
		d <sub>calc</sub> =	1616.5	nm

d <sub>max</sub> =	1659.5	nm
d <sub>min</sub> =	1618.7	nm
d <sub>avg</sub> =	1640.1	nm
d <sub>median</sub> =	1640.7	nm
Std. Dev =	15.4	nm
d =	1640.1 ± 30.7	nm
	(2 $\sigma$ )	
1609.4 ≤ d ≤ 1670.8 nm		

d <sub>max</sub> =	1659.5	nm
d <sub>min</sub> =	1597.3	nm
d <sub>avg</sub> =	1632.7	nm
d <sub>median</sub> =	1637.0	nm
Std. Dev =	17.5	nm
d =	1632.7 ± 35.0	nm
	(2 $\sigma$ )	
1597.7 ≤ d ≤ 1667.7 nm		

Wednesday	D	Violet - H $\gamma$	16.6	14.5	15.6	<b>1607.9</b>	<b>1.6%</b>	<b>0.5%</b>	431.0	0.6%
		Blue - H $\beta$	18.7	16.0	17.4				479.5	1.3%
		Red - H $\alpha$	25.0	22.3	23.7				645.0	1.7%
		Yellow - Na	22.5	20.5	21.5					
Thursday	D	Violet - H $\gamma$	16.8	14.6	15.7	<b>1607.9</b>	<b>1.6%</b>	<b>0.5%</b>	435.1	-0.3%
		Blue - H $\beta$	18.8	16.6	17.7				488.9	-0.6%
		Red - H $\alpha$	25.5	23.9	24.7				671.9	-2.4%
		Yellow - Na	22.7	20.3	21.5					
Miller	D	Violet - H $\gamma$	16.7	14.1	15.4	<b>1633.3</b>	<b>0.0%</b>	<b>-1.0%</b>	433.7	0.0%
		Blue - H $\beta$	18.7	15.9	17.3				485.7	0.0%
		Red - H $\alpha$	25.1	22.2	23.7				655.2	0.1%
		Yellow - Na	22.6	19.7	21.2					
Wednesday	E	Violet - H $\gamma$	16.4	14.4	15.4	<b>1637.0</b>	<b>0.2%</b>	<b>-1.3%</b>	434.7	-0.2%
		Blue - H $\beta$	18.3	16.2	17.3				485.4	0.1%
		Red - H $\alpha$	24.6	22.6	23.6				655.4	0.1%
		Yellow - Na	22.6	19.6	21.1					
Miller	E	Violet - H $\gamma$	16.4	14.2	15.3	<b>1640.7</b>	<b>0.0%</b>	<b>-1.5%</b>	432.9	0.2%
		Blue - H $\beta$	18.3	16.2	17.3				486.5	-0.1%
		Red - H $\alpha$	24.6	22.5	23.6				655.5	0.1%
		Yellow - Na	22.2	19.9	21.1					
Wednesday	F	Violet - H $\gamma$	17.2	14.4	15.8	<b>1597.3</b>	<b>1.4%</b>	<b>1.2%</b>	434.9	-0.2%
		Blue - H $\beta$	18.1	16.4	17.3				473.7	2.6%
		Red - H $\alpha$	25.5	22.6	24.1				651.0	0.8%
		Yellow - Na	23.1	20.2	21.7					
Miller	F	Violet - H $\gamma$	16.9	14.1	15.5	<b>1620.5</b>	<b>0.0%</b>	<b>-0.2%</b>	433.1	0.2%
		Blue - H $\beta$	18.9	16.1	17.5				487.3	-0.3%
		Red - H $\alpha$	25.2	22.4	23.8				653.9	0.3%
		Yellow - Na	22.8	19.9	21.3					
Tuesday	G	Violet - H $\gamma$	15.4	15.1	15.3	<b>1648.1</b>	<b>0.2%</b>	<b>-1.9%</b>	433.5	0.1%
		Blue - H $\beta$	17.4	17.1	17.3				488.7	-0.6%
		Red - H $\alpha$	23.7	23.3	23.5				657.2	-0.2%
		Yellow - Na	21.0	20.9	21.0					
Wednesday	G	Violet - H $\gamma$	15.5	15.0	15.3	<b>1651.9</b>	<b>0.0%</b>	<b>-2.2%</b>	434.5	-0.1%
		Blue - H $\beta$	17.5	17.0	17.3				489.9	-0.8%
		Red - H $\alpha$	23.7	23.3	23.5				658.0	-0.3%
		Yellow - Na	20.8	21.0	20.9					
Thursday	G	Violet - H $\gamma$	15.5	15.3	15.4	<b>1644.4</b>	<b>0.5%</b>	<b>-1.7%</b>	436.7	-0.6%
		Blue - H $\beta$	17.4	17.2	17.3				489.0	-0.6%
		Red - H $\alpha$	23.9	23.6	23.8				662.3	-1.0%
		Yellow - Na	20.8	21.2	21.0					
Miller	G	Violet - H $\gamma$	15.0	15.4	15.2	<b>1651.9</b>	<b>0.0%</b>	<b>-2.2%</b>	433.1	0.2%
		Blue - H $\beta$	17.0	17.4	17.2				488.5	-0.5%
		Red - H $\alpha$	23.4	23.6	23.5				658.7	-0.4%
		Yellow - Na	20.8	21.0	20.9					
<i>Crosshair crooked</i>										

Tuesday	H	Violet - H $\gamma$	16.9	14.2	15.6				440.8	-1.6%
		Blue - H $\beta$	18.3	16.1	17.2				486.3	-0.1%
		Red - H $\alpha$	24.6	22.4	23.5				655.7	0.0%
		Yellow - Na	22.2	19.8	21.0	<b>1644.4</b>	<b>0.9%</b>	<b>-1.7%</b>		
Wednesday	H	Violet - H $\gamma$	16.5	14.1	15.3				433.9	0.0%
		Blue - H $\beta$	18.5	16.0	17.3				487.6	-0.4%
		Red - H $\alpha$	24.8	22.4	23.6				658.3	-0.4%
		Yellow - Na	22.0	20.0	21.0	<b>1644.4</b>	<b>0.9%</b>	<b>-1.7%</b>		
Thursday	H	Violet - H $\gamma$	16.4	14.4	15.4				429.8	0.9%
		Blue - H $\beta$	18.6	16.4	17.5				486.7	-0.2%
		Red - H $\alpha$	24.9	22.9	23.9				655.8	0.0%
		Yellow - Na	22.1	20.6	21.4	<b>1618.7</b>	<b>2.5%</b>	<b>-0.1%</b>		
Miller	H	Violet - H $\gamma$	16.4	13.8	15.1				432.3	0.4%
		Blue - H $\beta$	18.4	15.6	17.0				485.2	0.1%
		Red - H $\alpha$	24.8	22.0	23.4				659.1	-0.5%
		Yellow - Na	22.0	19.6	20.8	<b>1659.5</b>	<b>0.0%</b>	<b>-2.6%</b>		