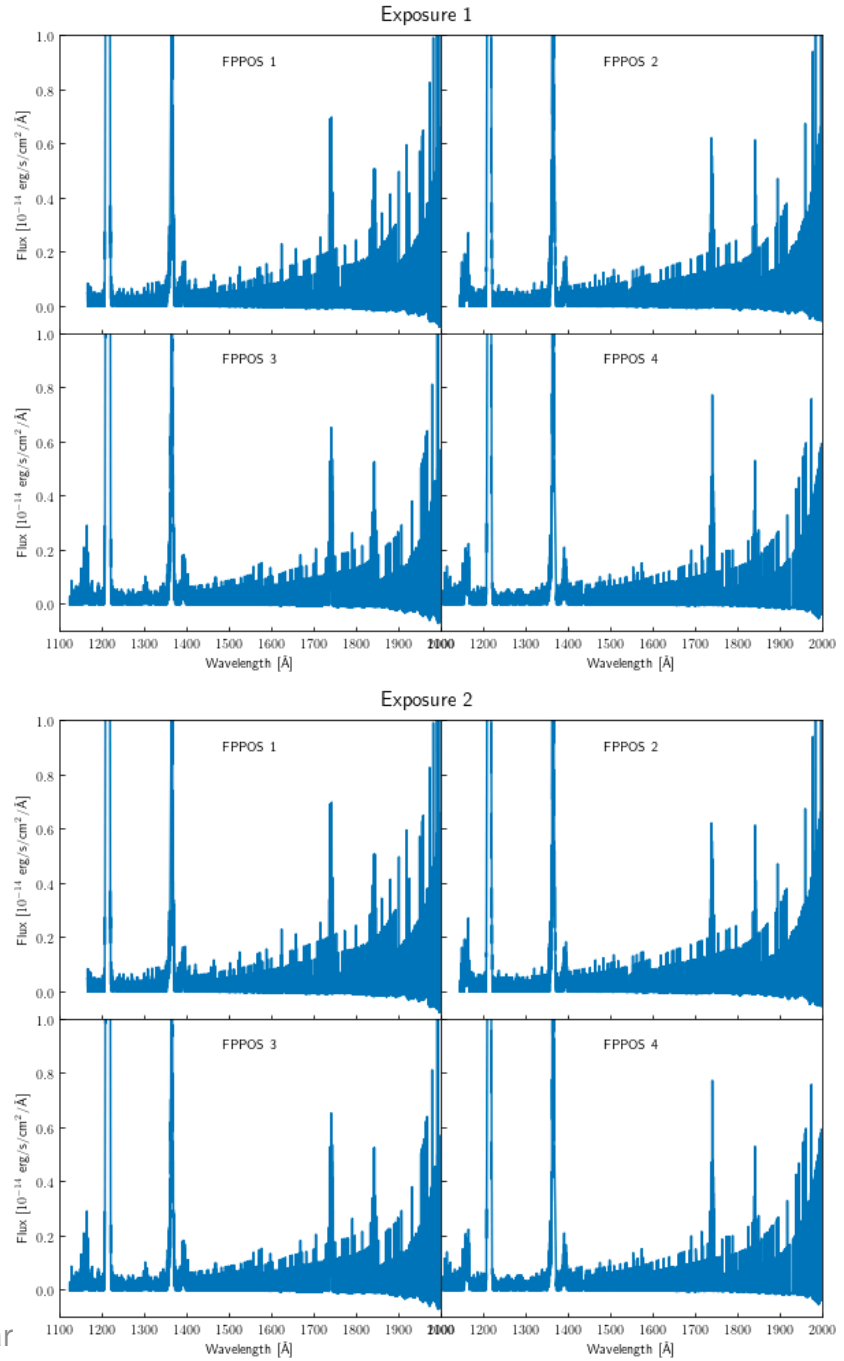
# Nuclear Spectrum

Jean J. Somalwar

# Separate Exposures

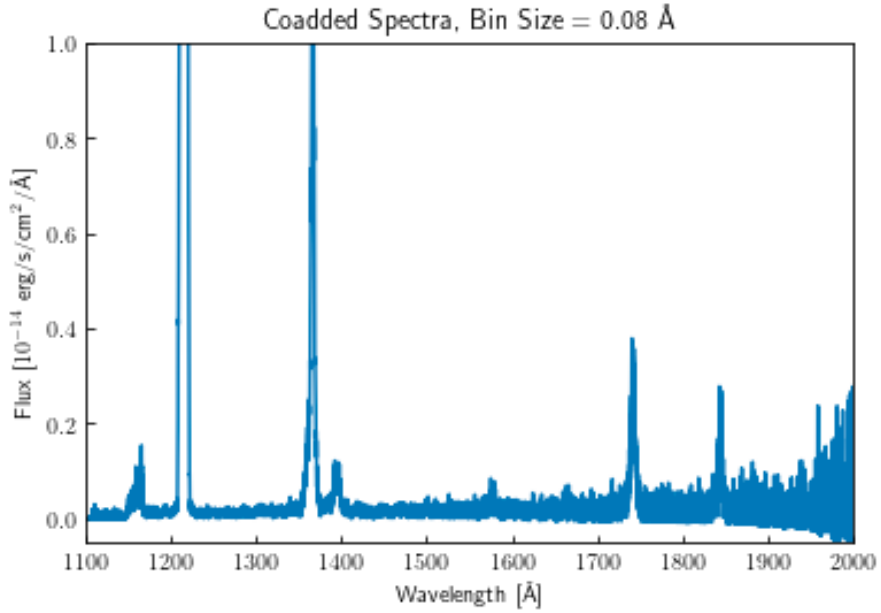
Cuts: DQ = 0 or DQ = 4

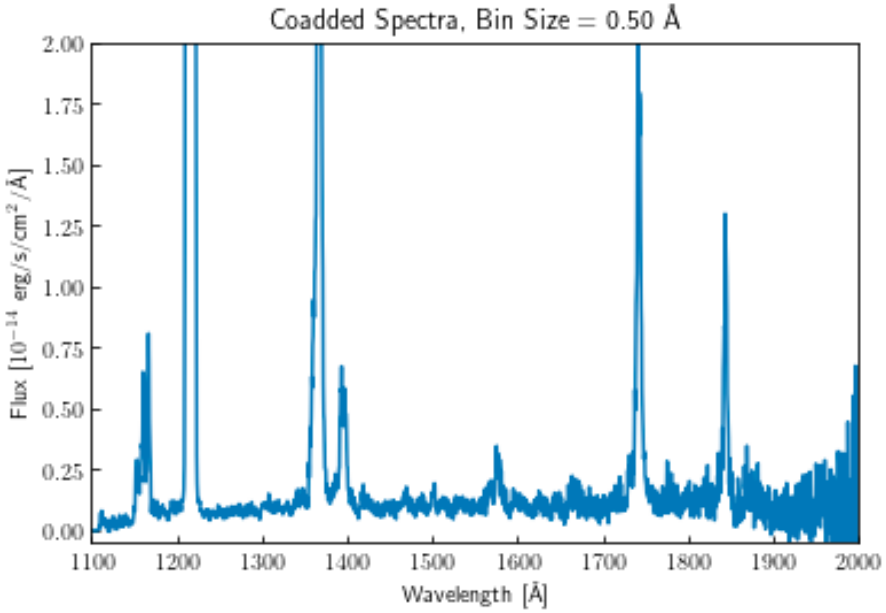
- DQ=0: No anomalies
- DQ = 4: Detector shadow



# Stacked Spectra

- Exposure weighted average of the 4 exposures
- Using wavelength bins with width given in plot titles
- Cuts: DQ=0 or DQ=4



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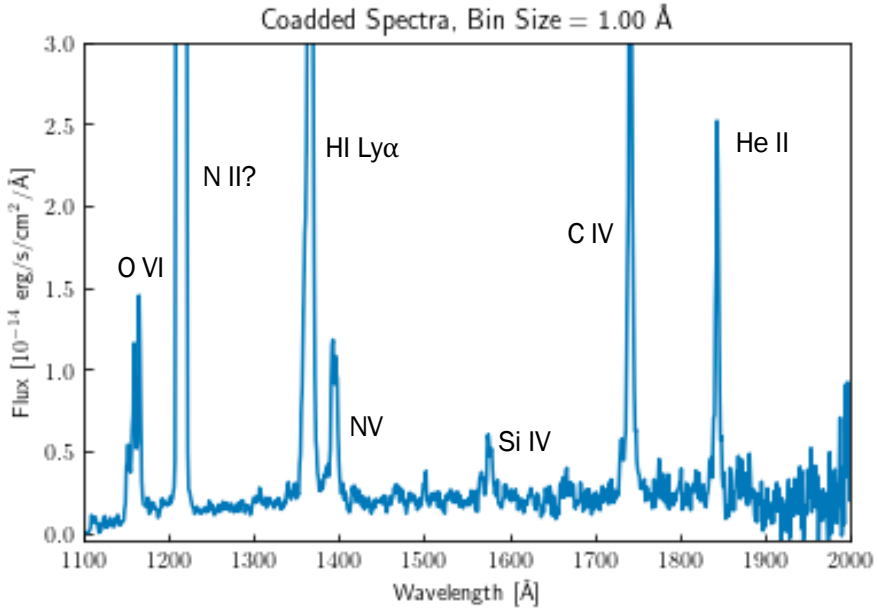


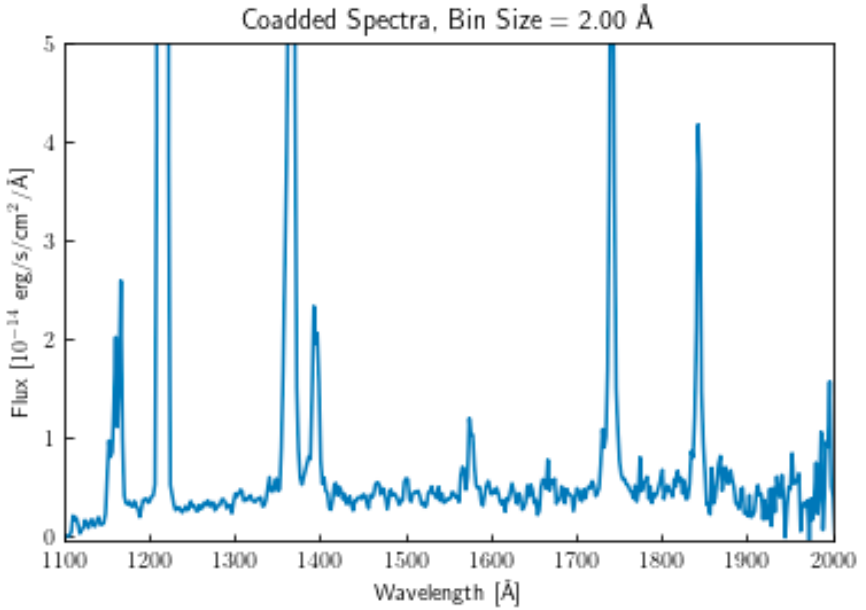

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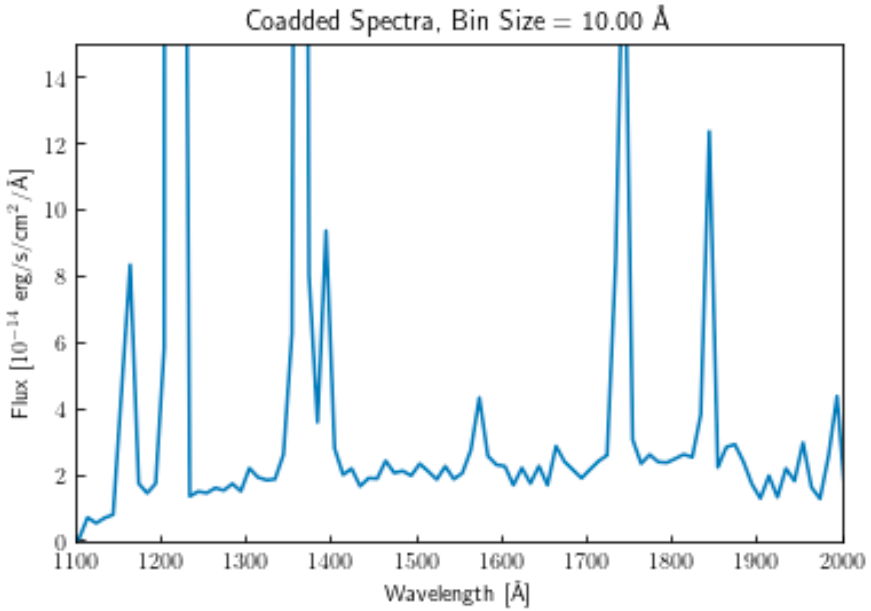
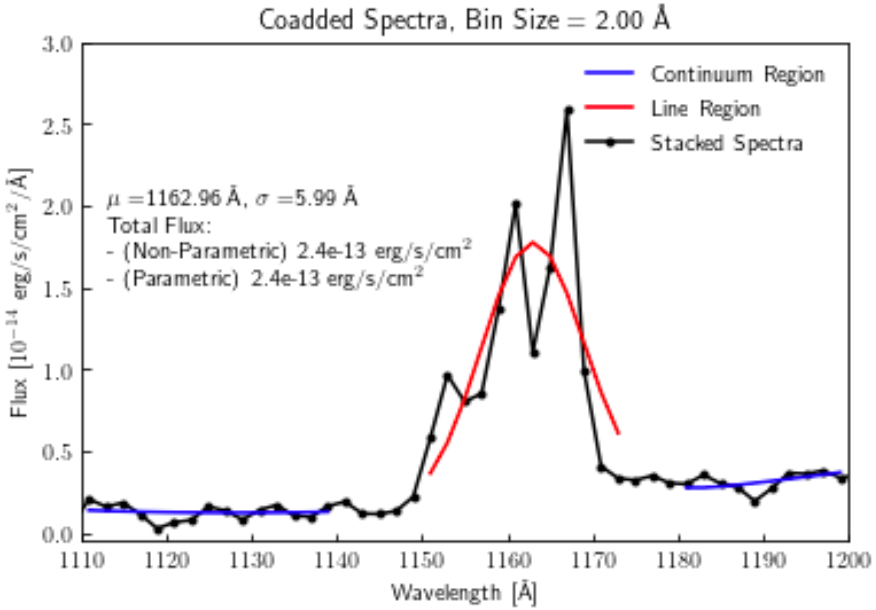


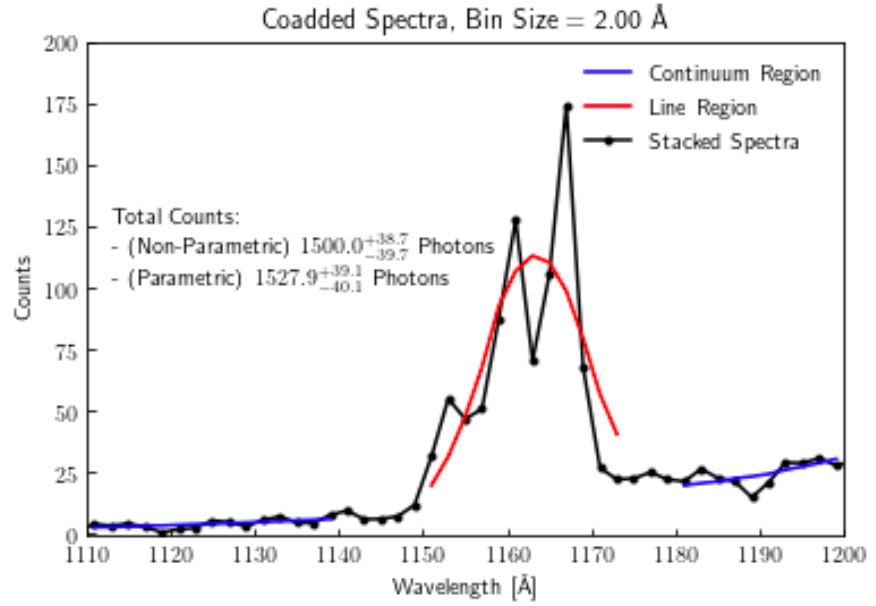
# Lines

| Element | Rest-Frame Wavelength (Å) | z = 0.1234 Wavelength (Å) |
|---|---|---|
| O VI | 1031.92, 1037.61 | 1159.26, 1165.65 |
| N II? | 1083.99 | 1217.75 |
| HI Ly α | 1215.67 | 1365.68 |
| N V | 1238.82, 1242.8 | 1391.69, 1396.16 |
| Si IV | 1393.75, 1402.77 | 1565.74, 1575.87 |
| C IV | 1548.19, 1550.77 | 1742.14 |
| He II | 1640.4 | 1842.83 |
| O III | 1665.85 | 1871.42 |

# Line Fits, O VI

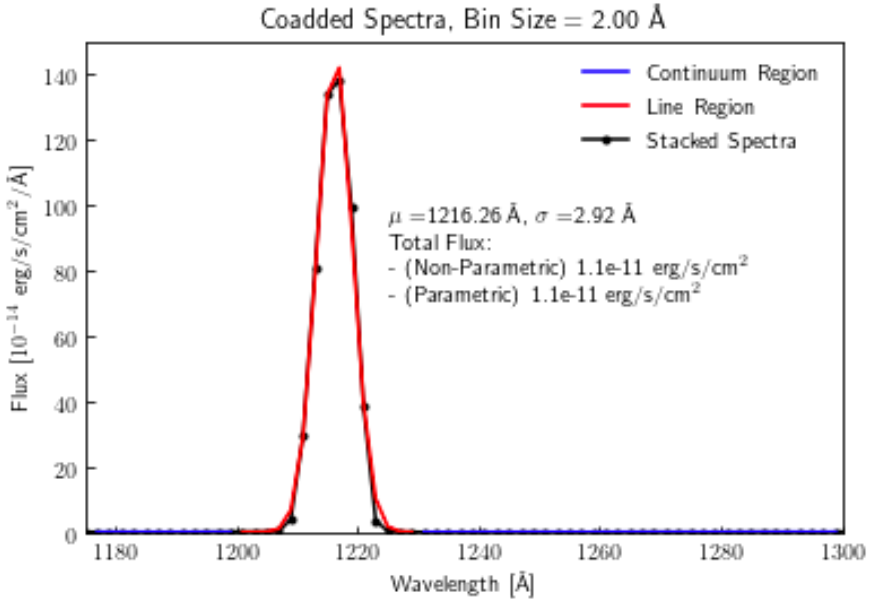
- Fitting the lines using the stacked spectra with wavelength bins of width 1 Å
- Blue: 2nd degree polynomial fit to continuum region (region bounds are approximate)
- Red: gaussian fit to line region (region bounds are approximate) (I'm pretty sure some of the lines are actually two lines, but for now I am fitting them with only one gaussian)
- Errors on count values are from astropy's poisson_conf_interval

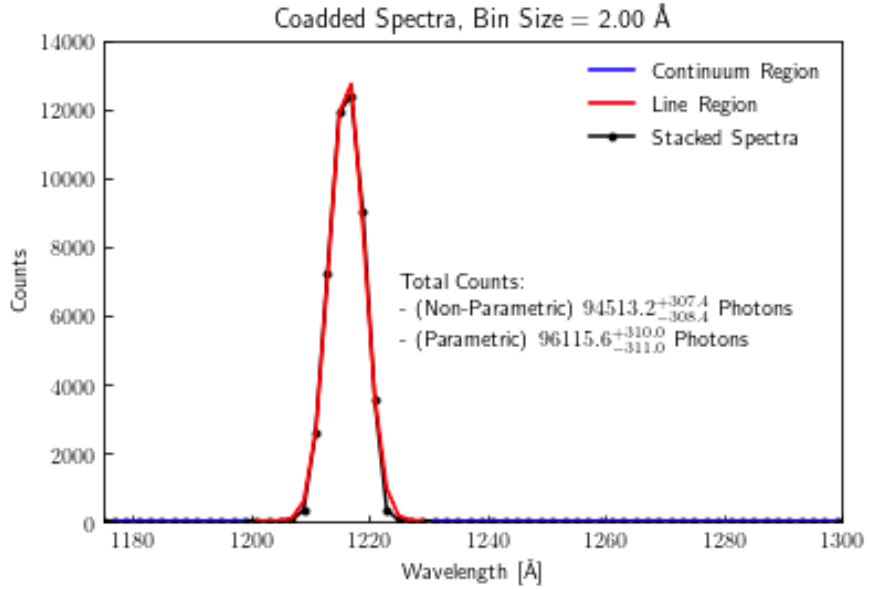


# Line Fits, N II?

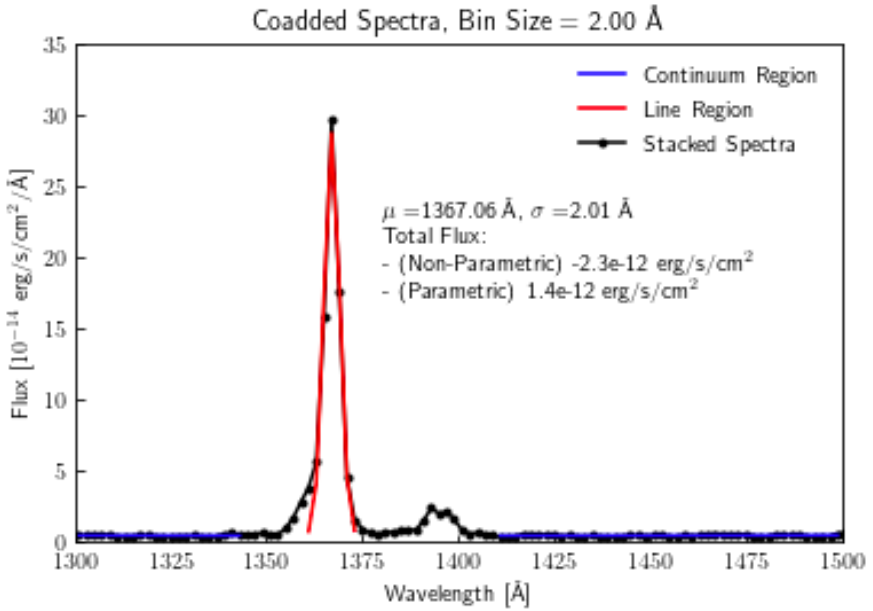
- Fitting the lines using the stacked spectra with wavelength bins of width 1 Å
- Blue: 2nd degree polynomial fit to continuum region (region bounds are approximate)
- Red: gaussian fit to line

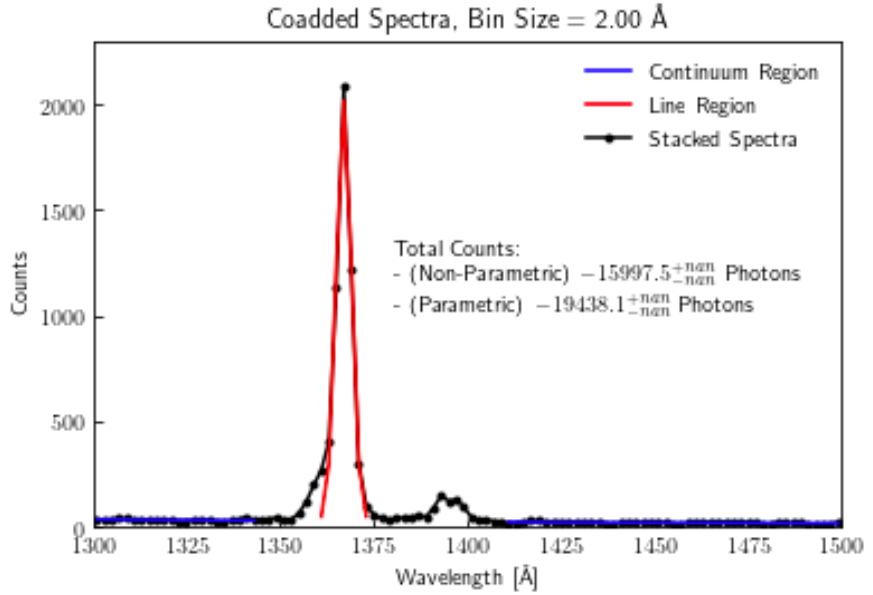


# Line Fits, HI Lyα

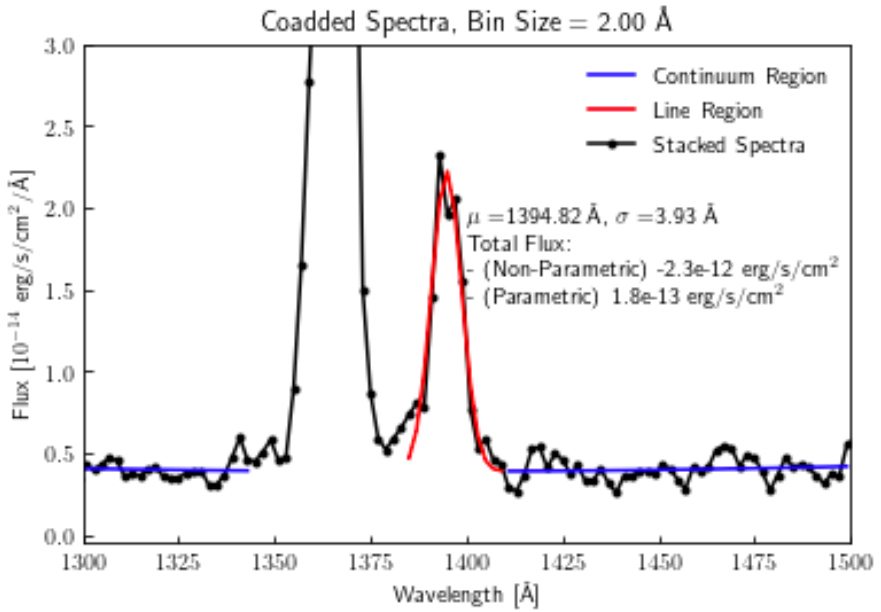
- Fitting the lines using the stacked spectra with wavelength bins of width 1 Å
- Blue: 2nd degree polynomial fit to continuum region
- Red: gaussian fit to line region

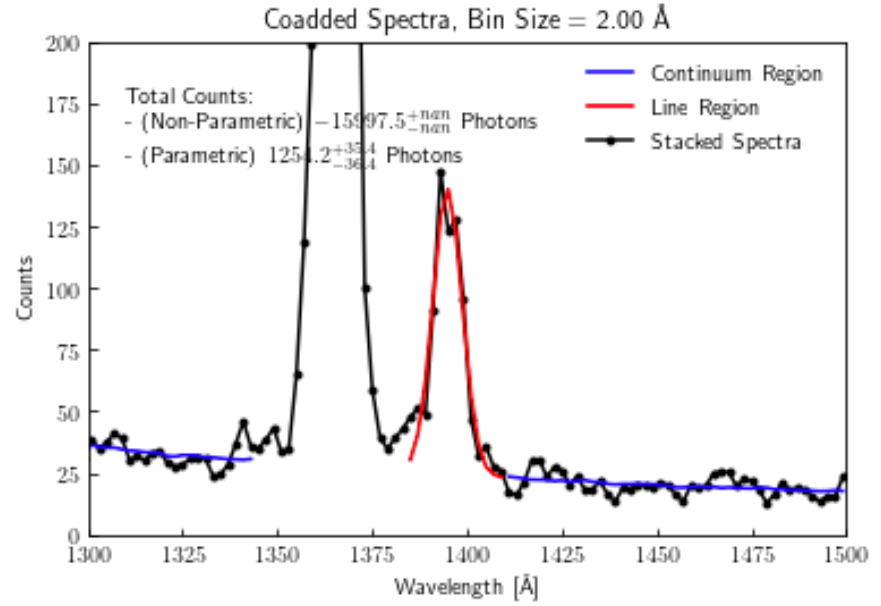


# Line Fits, N V

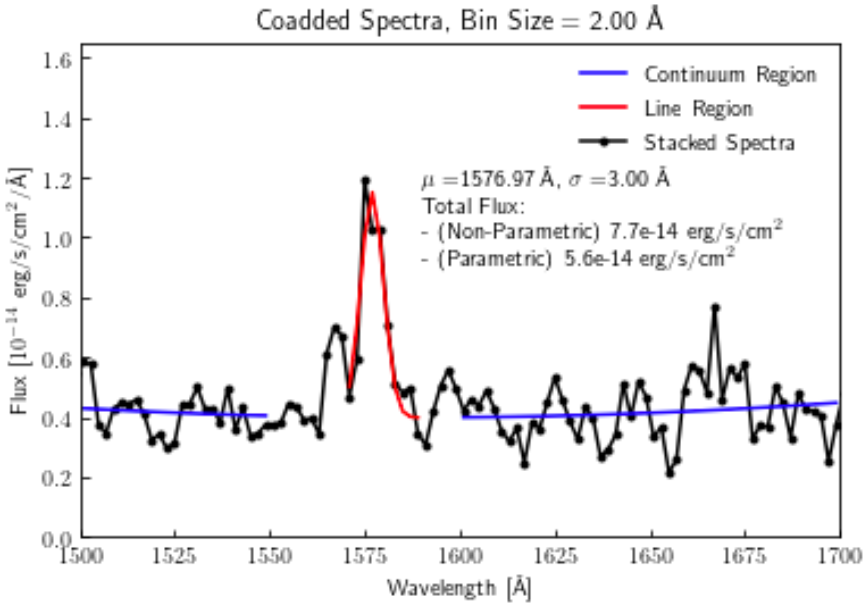
- Fitting the lines using the stacked spectra with wavelength bins of width 1 Å
- Blue: 2nd degree polynomial fit to continuum region
- Red: gaussian fit to line region

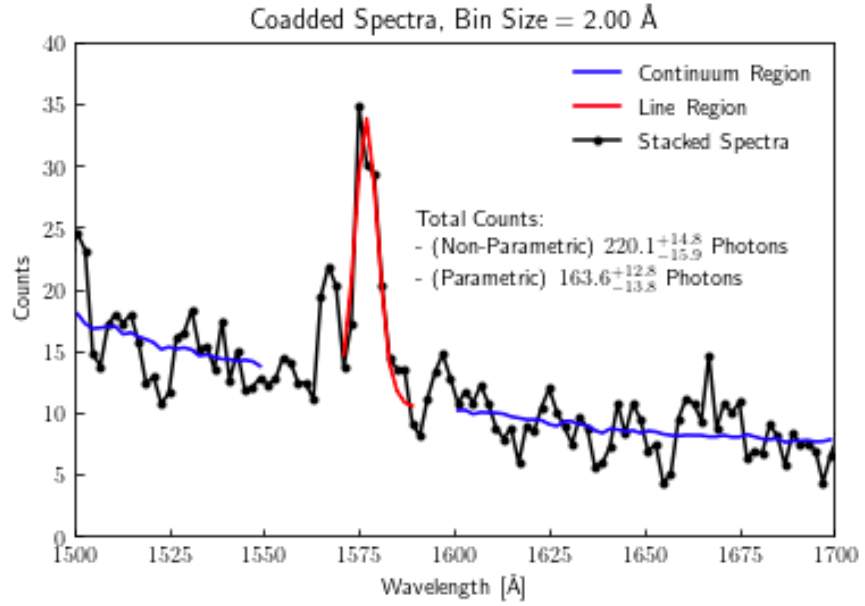


# Line Fits, Si IV

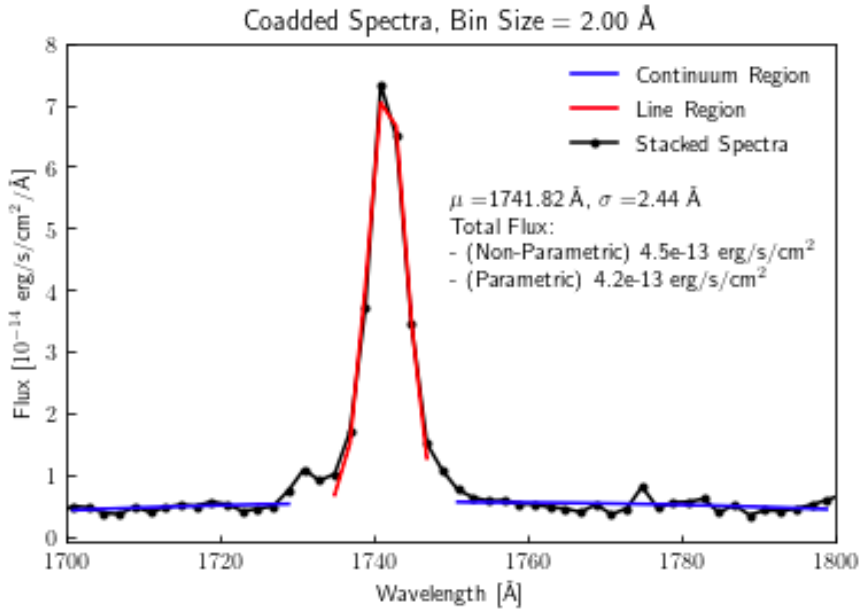
- Fitting the lines using the stacked spectra with wavelength bins of width 1 Å
- Blue: 2nd degree polynomial fit to continuum region
- Red: gaussian fit to line region

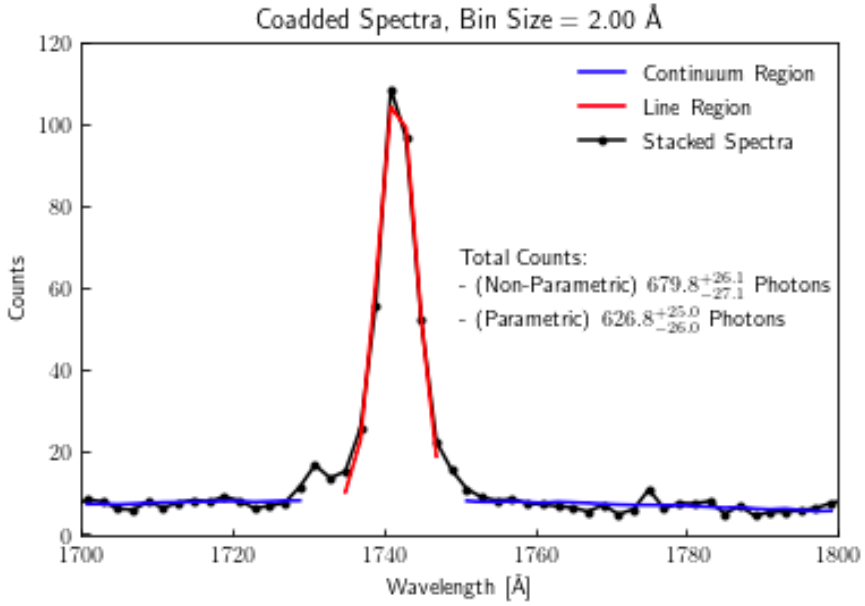


# Line Fits, C IV

- Fitting the lines using the stacked spectra with wavelength bins of width 1 Å
- Blue: 2nd degree polynomial fit to continuum region
- Red: gaussian fit to line region



# Line Fits, He II

- Fitting the lines using the stacked spectra with wavelength bins of width 1 Å
- Blue: 2nd degree polynomial fit to continuum region
- Red: gaussian fit to line region