Physics 233 **Exercise 3 (Due Mon. Feb. 3)** Winter 2014

1. Consider the following measurements of the C IV lines from the two intervening absorption line systems shown in the spectrum below.

	CWL($\mathring{A}$)	$W_\lambda(\mathring{A})$	$FWHM_{obs}(\mathring{A})$
cloud 1	5668.29	0.53 ± 0.17	0.60
	5677.99	0.48 ± 0.16	
cloud 2	5669.65	0.32 ± 0.10	0.60
	5679.25	0.170 ± 0.058	

Use the f values and wavelengths from Morton et al. 2003 ApJS, 149, 205 as needed to answer these questions.

(a) What is the redshift of each absorbing cloud?

(b) What is the C^{+3} column density in cloud 2?

(c) What is the temperature of cloud 1?

(d) The corresponding Lyα line of HI is a single saturated blended line with no apparent damping wings, and an observed equivalent width of 3.0 ± 0.03 $\mathring{A}$. What limits can you place on the column density of HI for the combined clouds?