Grading Rubric for Papers in Physics 480W
The Matrix
title of reviewed paper: manuscript f paper # 4

Table 1: grading rubric: each evaluative category (row) is scored on a 3-2-1 basis. Each category is weighted (w, shown next to the category descriptor below) either 2, 1, or 1/2. The total number of points possible per row is then $3 \times w$, (i.e. 6pts are possible for row 1). There are 9 total rows, and 30 total points possible. The grades recorded will be, however, a score out of 100 arrived at by dividing the student's score by the total possible, etc., etc. Note that physics content accounts for 18/30 of the total, or 60% of the total grade. Grammar & composition, and formatting account for 40%.

	Proficient (3pts.)	**Intermediate (2pts.)**	**Developing (1pt.)**	**total-whiff (0pts.)**	Score
Physics Content, 18 pts. possible					
Correctness (w=3)			x		3
error analysis (w=2)			x		2
completeness (w=1)		x			2
Grammar & Composition, 9 pts. possible					
level of prose composition (w=1)		x			2
level of sentence syntax (w=1)	x				3
diction (w=1/2)	x				1.5
"Math as Prose" (w=1/2)		x			1
Formatting, 3 pts. possible					
LaTeX formatting (w=1/2)		x			1
AIP formatting (w=1/2)		x			1

Comments: 16.5/30 = 55%

1. I look forward to the value calculated for n_e to appear in the abstract and elsewhere.
2. you report $2.28 \times 10^5 \geq C_s \leq 2.75 \times 10^5 cm/s$, a modest increase, yet it should double if kT_e quadruples, as reported....I hope that surprise is addressed.
3. in the paper-mapping information at the end of the introduction, give the actual section numbers.
4. I think you want 'ion saturation current' wherever you say 'ion current' in section II.
5. where to put the comma after the math-prose in equations 1 & 2? probably after the last conditional inequality....eq 8 ends the sentence. So there are some 'math as prose' issues to fix.
6. I don't think figure 1 is cited in the text. Probably in section III A.?
7. your measured Cs for the low pressure case seems low compared to expectations. Your graph 3 (and all the I-V characteristics) looks really good. You get Cs from the toneburst method for 0.13 mTorr (where you expect Te to be somewhere between 2.5 and 3 something eV), gives 2.75km/s. If you took Te to be 1eV, you'd get 1.55km/s and so for 4eV that's 3.11km/s....but you get 3.7km/s for an even cooler Te, so there is something fishy with the calculation. Plus, looking at figure 6, I thing the first data point is real, maybe your best one because the signal is biggest. Then it looks like you guys pulled the probe out a little more than a cm, and the delay time increased by about 2 microsec. At any rate, if you drew a line (theory curve, not 'best fit') through the origin for Cs for Te 3eV, my guess it would pass pretty close to your last data point. The data looks a little fishy too, not very linear.....was it hard to make sure that you were measuring the delay times between the same two features of the sent and received signal?

8. There are some LaTeX issues in ref. 2

9. The data for the high pressure case looks pretty good, nice linear data. Definitely cooler Te, about 2.1 km/s, or about 1.8eV, which according to your graph (figure 3) fits with a neutral pressure of about 0.4 mTorr. So I disagree with the calculation in (10); I think that's too high. But you should quote the Te you got from the I-V characteristics you took for 0.13mTorr and the 0.8mTorr cases. Only parameters that matter for the Cs data are the I-V characteristics that your group took the day you measured IAW group velocities....you don't quote the measured results. It's possible on different days, the same neutral pressure would go with a different Te and this could be due to aging of the filaments.....so be careful

10. Uncertainty should come from the error bars estimated for the plotted data points. I agree though that the spread in the data increase uncertainty. Graph 6 doesn't show a nice linear progression, which increases the uncertainty. In the abstract though you want to be able to compare discrepancy and the uncertainty and explain how each was quantified.

11. thinking about the model to measurement comparison, I think this works best if you can show that you are in the long-wavelength limit, that is, the wavelength is long compared to the Debye length. You'll have to calculate a Debye length for some appropriate limiting case to give the reader a sense of the figures of merit. You'll need an n_e for that... Further, to appreciate the difference between a group velocity and the phase velocity, you'll need to discuss the dispersion relation in more detail.