1/20/05

Hi Joe:

I wanted to take this opportunity to give you an update on the progress that has been made in recent months on the gas cell project. Though most of my time in the past few months has been spent writing my thesis, I have done some additional work perfecting our simulations in an effort to better match the data we received from Jim Bailey. As you may have noticed in our first matches of our synthesized spectral data to the experimental data, the H-like lines we predicted were too strong and the Li-like lines too weak when compared to the experimental data. From these observations, we concluded the gas cell plasma temperature we were predicting was too high, causing the spectrum to be dominated by features representative of higher ionization states. In an effort to lower the predicted plasma temperature, we obtained from Greg Rochau a new pinch power profile and new albedos for the metal surfaces in the experiment, and incorporated these in our VisRad calculation. We saw that using the new albedos and pinch power profile lowered the gas cell plasma temperature a little, but not enough to bring the theoretical H-like and Li-like lines into agreement with the measured experimental lines. We think perhaps our gas cell is not in the right position, so hopefully through consultation with Jim Bailey we will either verify our current position or find out where the cell should be located.

I'm also writing to you today because I was hoping you would be able to help me with a problem I am having with Spect3D. Currently, regardless of what *.EXO file I read into my Spect3D workspace, the available simulation output times are in steps of 10 nanoseconds. In my most current Helios simulation, the time steps after 90 nanoseconds are 2 nanoseconds, so you can imagine my surprise when Spect3D only offers me time steps of 10 nanoseconds after 90 nanoseconds. Originally, I thought this might be a problem with my original Helios workspace (with which I started in making all of my later workspaces), so I made a new Helios workspace (and Spect3D workspace) from scratch only to find that I encountered the same time step problem. I have packaged all of the workspace and input files I am currently using for my latest simulation in a *.ZIP archive available for download in your section of my research webpage:

http://astro.swarthmore.edu/~shupe/joe.html

file: `latest_simulation.zip`

I would like to include in my thesis some time resolved spectra (both absorption and emission) for several times close to the peak of the pinch emission, so if you could take a look at my workspaces and see if you can find a fix for this problem, I would be most appreciative.

Lastly, if you would like to see an image of the poster David and I presented on the gas cell project at the 2005 AAS Meeting in San Diego, click on the link labeled 2005 AAS POSTER under the MISCELLANEOUS section of my research website.

Thanks, and I look forward to hearing from you.

--Nate