

Visitor Research Report

Visitor Name: Mr. Lyndell Hockersmith
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Area of Research: Solar Wind-Magnetosphere Interactions

Period of Visit: May 12, 2008 – July 25, 2008

Goal:

I came to work at the NIA for Dr. Clauer over the summer from the 12th of May to the 25th of July, 2008. The goal in coming to work at the NIA for the summer was to benefit from the existing personnel at the NIA under Dr. Clauer. Various people were visiting Dr. Clauer over the summer and it was decided that not only would it be good to meet these visiting scholars in person, but to be close at hand to interact with them and use their experience. It was also hoped that Rick Wilder, the other graduate student, could help teach me the various programs that I would be constantly using in the research I'd be doing while at NIA as well as later. In addition to these goals was the goal of making progress researching the area of storm sudden commencements and sudden impulses, two distinct responses to the Sun's behavior.

Strategy:

The meetings with the visiting scholars were helpful, as one group were theorists. Since our group is data-based, it was good to understand how the theoretical groups work, and how they progress with ideas and incorporate the data into their models. Especially how unexpected data forces them to change models and how they try to take a model that is believe to be mostly correct and modify it to account for unexpected data. In this case they had a model for a responses when the magnetic field of the sun was oriented a particular way, but then a case where the field was oriented entirely opposite forced a change in the model. Another visiting group was there for the validation of a new way to analyze data. That was instructive in several areas. Statistics had never been my particular strong suit, and learning ways to detect artificial results. They also helped explain how certain methods were chosen to analyze the data, from resolution to speed, and the difficulties that surround the SuperDARN network. For their particular case was the problem of non uniform time sampled data and trying to analyze that data. I was also there to learn from Dr. Clauer and Rick Wilder. Dr. Clauer was particularly helpful in discussing the results of various events that I had found or was currently analyzing. His decades of experience was something to try to learn from, especially the tricks he has picked up to quickly determine what an event was doing, what might be worth investigating. Rick Wilder was critical in understanding how to run a multitude of programs that were critical in continuing my research. The group had over the years had custom programs created, and some had rather larger learning curves. I had to learn shell scripting on an Apple computer as well how to navigate certain pitfalls in the non-perfect coding of the program. I also was taught how to run IDL as well as the IDL program for a unique way to plot a magnetometer data set.

Accomplishments:

My accomplishments were modest. I successfully learned how to continue my research on my own, without relying on either Clauer or Wilder to decipher results, or to start or debug the programs I use. I also identified multiple events worth further research. The research is in whether there is a particular rare response to the sun's behavior, and a few events had originally been found and I was tasked with trying to expand the list of identified atypical responses. I was successful with finding a few, and found a list of all events to continue investigating when I returned to Virginia Tech. I have since finished investigating a large number of events, finding a modest list of very likely candidates. I will now be taking an in depth look at each of the specific events to confirm their atypical status and then looking for patterns in each confirmed case to find if there is a particular signature or driver of these atypical events.

Pending Publications:

There are at present no pending publications.