DaViTPy
(Data Visualization Toolkit – Python)

N.A. Frissell and DaViTPy Team
What is DaViTPy?

• An open source space science analysis toolkit developed primarily in Python.

• Originally started at Virginia Tech.

• Now an active, international collaboration!
What is DaViTPy?

• Originally to support SuperDARN.
• But we have a bigger vision...
• Already, tools to assist in general space science studies. Python access to:
  – IRI
  – MSIS
  – Tsyganenko
  – AACGM
  – Satellite Data
  – All SuperDARN Data
Current Collaborators

• Virginia Tech
• University of Alaska Fairbanks
• University of Saskatchewan
• University of Leicester
• And others…
The ideas in this presentation allow for collaboration as Space Science has not seen before!!!
Why Python and FOSS?

- Python is a Free, Open Source programming language.
- No license fees!
  - Able to share with anyone
  - Run on as many machines as you like
- Very large, active user base, including researchers.
- Incredible amount of support on Internet
Main Collaboration Tool

Git and GitHub

- Discussion
- Version Control
- Bug Tracking
- Collaboration
- Transparency

You can go on this website right now and see everything...

nafrissell@vt.edu

19 September 2014
• Set of rules everyone agrees with.

• Author: Vincent Driessen

• Original blog post: http://nvie.com/posts/a-successful-git-branching-model

• License: Creative Commons BY-SA
Code Review and Discussion

Feature goes #92

w2naf wants to merge 21 commits into develop from feature-goes

w2naf commented 9 days ago

Hi!

This is a module for downloading, plotting, and analyzing GOES x-ray day for the purpose of identifying Solar Flares. The module consists of the following functions:

Module: gme.sat.goes

Functions:
* :func: gme.sat.read_goes
* :func: gme.sat.goes_plot
* :func: gme.sat.classify_flare
* :func: gme.sat.flare_value
* :func: gme.sat.find_flares
This notebook shows how to download and plot GOES data.

In [1]:
# Import required libraries.
from matplotlib import pyplot as plt
import datetime
import gsw #This is the DavitPy Geomagnetic Environment module

In [2]:
# Define the start time, end time, and which GOES Satellite to use.
# Make sure the satellite is available for your particular interval period.
# Data will be downloaded directly from NOAA at
# http://satdat.ngdc.noaa.gov/sam/goes/data/hmr_avg/
start = datetime.datetime(2014,5,21)
end = datetime.datetime(2014,5,24)
win_nr = 15

In [3]:
# This routine will download the data from NOAA and populate a dictionary containing
# metadata and a dataset with the GOES data data.
# This routine downloads the 1-min Avg X-ray flux data for two bands
# (0.05-0.4 am and 0.1-0.8 am).
goes_data = gsw.sat.read_goes(eTime,eTime,sat_nr)

Downloading g15_xray_20140521_20140524.nc...

In [4]:
# This routine will use the dictionary format provided above to plot the GOES data.
fig = gsw.sat.goes_plot(goes_data)
• Open source collaborative projects have been proven to be very successful
  – Linux, Mozilla, Apache, Et al.
• We now have a way for space scientists to share, reuse, and review code.
• Python and Git/Github skills translate well to software projects outside of space science
  – Woo! Student training!!
• Please join us!!