

Development of web based graphical user interface for x-ray Instrumental data in secure manner

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ABSTRACT

In satellite XSM(X-ray solar monitoring) camera capture images that contain so many physical data. XSM camera gives result on FITS file format. FITS file format contain so many astrological data. In this research paper gives idea about how to processing on it and developing GUI based application. The Flexible Image Transport System (FITS) standard has been a great boon to astronomy, allowing observatories, scientists and the public to exchange astronomical information easily. FITS file (Flexible Image Transport System) (Flexible Image Transport System) is a portable file standard widely used in the astronomy community to store images and tables.

Keyword: - FITS file ,Astropy.io , fv module , matplotlib.lib etc....

1.Introduction of FITS file

FITS file support many languages like c, c++ , python , php. In this research paper For data Processing on FITS file we use python for data processing and php and LAMP server for develop GUI based application. [1]

1.1 Data processing FITS file with python module

Python module support astropy.io module. The astropy.io provide to access FITS file. The open() function has several optional arguments which will be discussed in a later chapter.[2] The default mode, as in the above example, is "read-only". The open function returns an object called an HDULIST which is a List-like collection of HDU objects. An HDU (Header Data Unit) is the highest level component of the FITS file structure, consisting of a header and (typically) a data array or table.

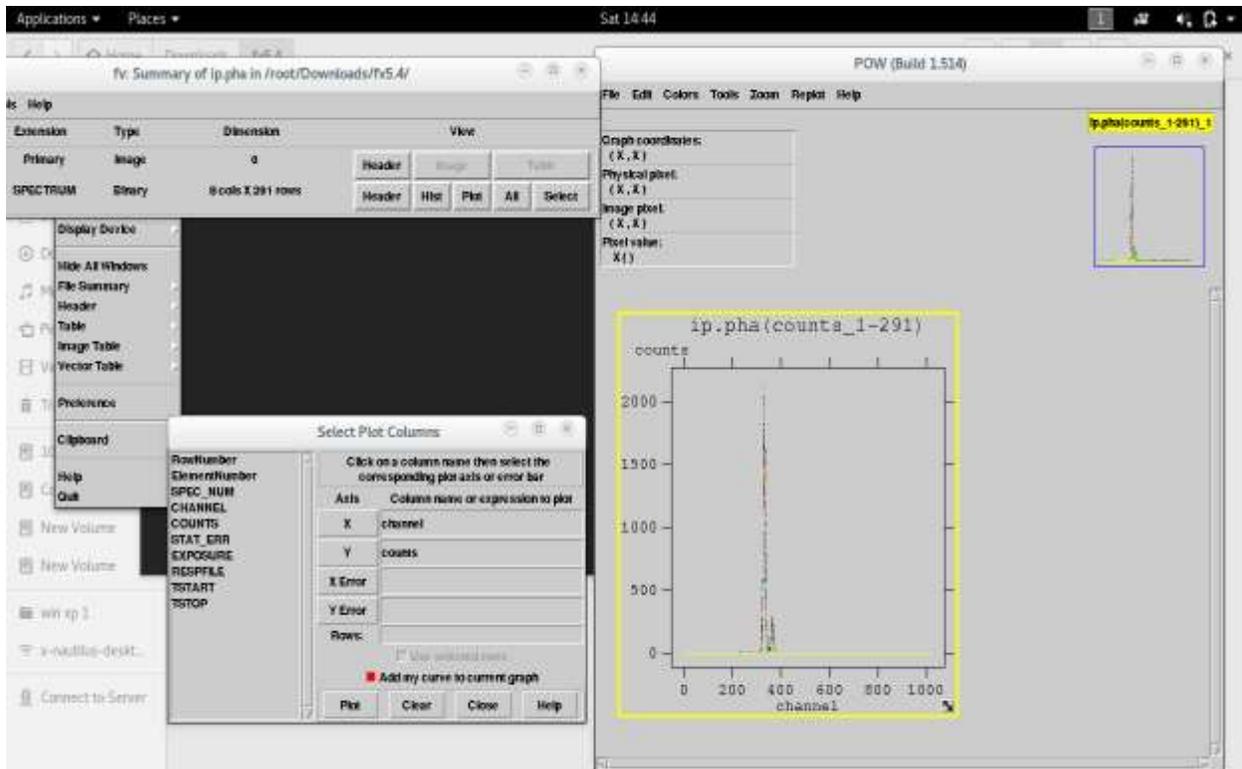


Fig-2 Accessing FITS file with fv

The .pha filename extension is primarily associated with the Pro/ENGINEER Application Starter (.pha) file type/format. Pro/ENGINEER (Pro/E) by PTC is a complex and powerful parametric CAD system catering to many industries. Pro/E is often used in pair with PTC Windchill PTC's product lifecycle management (PLM) software. The .pha file is an auxiliary data file that serves as a pointer to a remotely hosted Pro/E part (.prt) or assembly (.asm) model. When an attempt is made to download the CAD file from within a Windchill session or use the "Open in Pro/ENGINEER" menu command, a .pha file is generated and downloaded instead. Opening the .pha file causes Pro/E to launch and use the provided context to retrieve and open the requested item.

2.1 Installing LAMP server in Linux

The **LAMP server (Linux, Apache, MySQL, PHP)** (or Perl) is one of the most important **servers** you might ever set up. It will happily serve up dynamic, database-driven web sites without needing constant babysitting. Since the LAMP server's underlying foundation is Linux it enjoys rock-solid reliability, security, and can be installed on all kinds of hardware

2.2 Step for installation

There are 3 module install for the apache server Apache, MYSQL & php. Apache is the web server piece of our puzzle. From within your terminal window issue the command `:sudo apt-get install apache2`If, by chance, you are using a distribution that does not use Sudo, you will need `su` to the root user and issue the above command without the `sudo` command. Depending on your OS installation, the above command might need to pick up some dependencies. If so, okay those dependencies. At the end of the installation, Apache should automatically start. If it doesn't, issue the following command: `sudo /etc/init.d/apache2 start`. You can now open up a browser and point it to the IP address (or domain) of the server to get the famous "It works!" page. You are ready to move on to PHP.

Php

For the purposes of this article, we will assume the "P" stands for "PHP." To begin the process of installing PHP, issue the following command: `sudo apt-get install php5 libapache2-mod-php`. Again, depending upon your OS installation, this might require some dependencies to be met. Allow apt-get to pick up those dependencies. When the installation is complete, restart Apache with the command: `sudo /etc/init.d/apache2 restart`. Now, let's give PHP a little test to make sure it has installed. In your terminal window, create a new file called `test.php`. Save that file and place it in `/var/www/`. Now, open up your browser to the address `http://ADDRESS_OF_SERVER/test.php`. Where ADDRESS_OF_SERVER is the actual address of your server. You should see "Test PHP Page" in the browser. You are now ready to move on to MySQL.

MySQL

MySQL is the database piece of the puzzle. This installation requires a few more steps than what you've just experienced. The first step is to install the server itself with the command: `sudo apt-get install mysql-server`. Again, depending upon your OS installation, there might be some dependencies to be installed. After the installation is complete you need to log into the MySQL prompt and give the administrative user a password. Do this by following these steps:[4]

1. Log into MySQL with the command `mysql -u root -p`.
2. As no password has been configured, you will only need to hit enter when prompted for the password.
3. Enter the command `SET PASSWORD FOR 'root'@'localhost' = PASSWORD ('YOURPASSWORD');` Where YOURPASSWORD is the password you want to use for the administrative user.
4. Now quit the MySQL prompt by issuing the command `quit` and hitting enter.
5. Start the MySQL server with the command `sudo /etc/init.d/mysql start`.

That's it. Your LAMP server is now up and running. But what about this one-command method? Simple. From your terminal window, issue the command: `sudo taskset`. This command will open a curses-based tool which allows you to select numerous software options for installation. One of those selections is a LAMP server. All you need to do is mark LAMP server for installation (scroll down with your arrow keys and then hit the space bar to select). Once you have selected LAMP server, hit the Tab key on the "button" and hit the Enter key.

3. Generating graph based on FITS file

According to variable that store in FITS file we can use able to put graph using `matplotlib` python module. Python module contain `matplotlib` file. `Matplotlib` is a Python 2D plotting library which produces publication quality figures in a variety of hardcopy formats and interactive environments across platforms. `Matplotlib` can be used in Python scripts, the Python and `IPython` shell, the `jupyter` notebook, web application servers, and four graphical user interface toolkits.

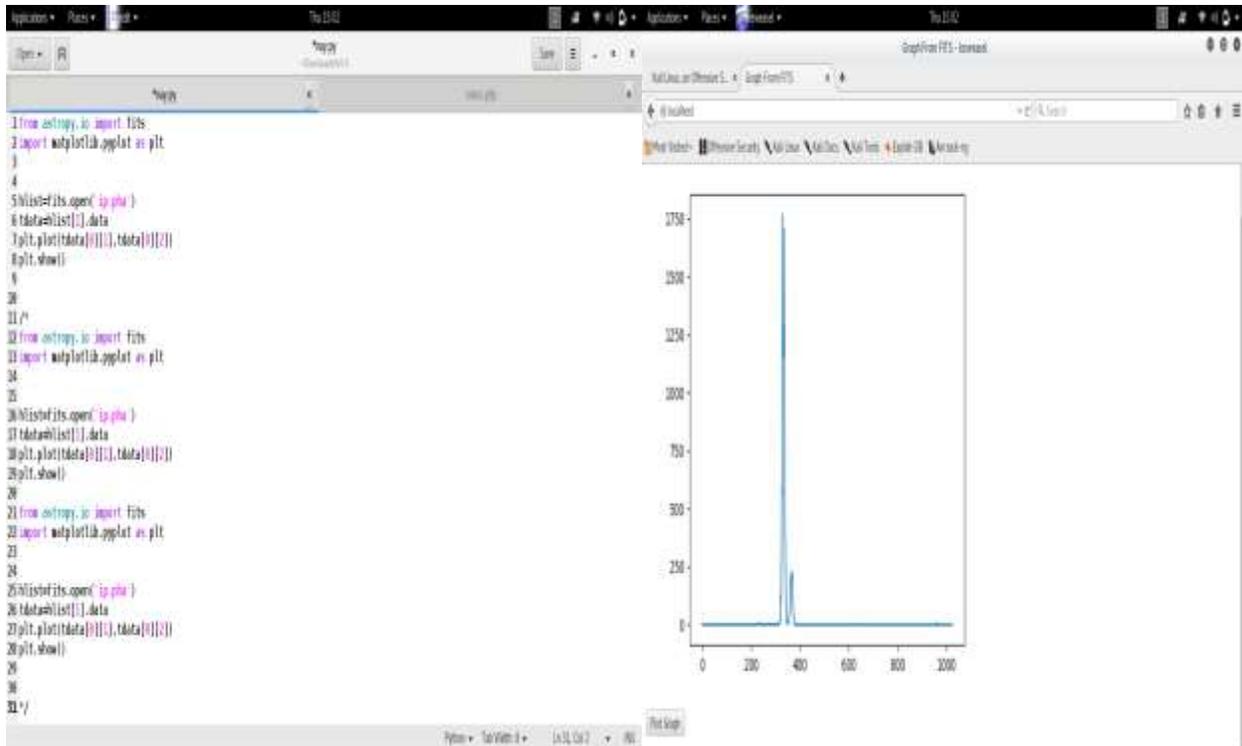


Fig-3 Plotting FITS data with matplotlib

Matplotlib tries to make easy things easy and hard things possible. You can generate plots, histograms, power spectra, bar charts, error charts, scatter plots, etc., with just a few lines of code. For a sampling, see the screenshots, thumbnail gallery, and examples directory

For simple plotting the pyplot module provides a MATLAB-like interface, particularly when combined with IPython. For the power user, you have full control of line styles, font properties, axes properties, etc, via an object oriented interface or via a set of functions familiar to MATLAB users.

3.1 Interacting python and php module in LAMP server

Linux environment there is 'var' directory in with all data host to the local host. With the help of local host and web based language we develop all the module to local host and we can make a Graphical user interface.



Fig-4 Interacting FITS file with python and LAMP module

Graphical User interface is develop in PHP module.PHP module use for GUI in backend process there is python script runs based on it we can interacting all the module successfully.

4. CONCLUSIONS

On the base of this experiment we can conclude that data processing of all astronomy data through FITS file is possible. We can use PHP web based language for easily interaction with FITS file. There is LAMP server interacting module gives best performance with FITS file. We can also retrieve data form PHA format and do the what we required for it.

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