Basic guide to running ARTop

These notes are to help you get started running ARTop, as well as resolving download issues.

Step 1:

Download ARTop from https://github.com/DavidMacT/ARTop and follow the install instructions given there.

Step 2:

Fill in read_data.txt. An example is given here:

```
Region number=833
Download data=true
Start year=2011
Start month=09
Start day=03
Start hour=02
End year=2011
End month=09
End day=03
End hour=03
Velocity smoothing=20
Input directory=/home/ARTop/input
Output directory=/home/ARTop/output
Topology=true
Cutoff=50
Sampling=5
Remove downloaded images=false
Registered email=you@address.com
```

Please see online for details about each variable.

Notes:

Days, months and hours are written with two digits, e.g. 02 not 2.

The input and output directories require full paths. If these do not exist, ARTop will create them.

You must register you email with JSOC:
http://jsoc.stanford.edu/How_toget_data.html

Step 3:

Type 'python run_ARTop.py'. If you wish to run the code in the background and send the output messages to a file, type something like 'python run_ARTop > out &'.

Step 4:

Once finished, the output data files will be stored in the Data folder of the output directory. Two parameter files, 'specifications.txt' and 'header.txt' are also in the output directory. These data can be accessed with the analysis routines provided with ARTop. To learn how to use these, please consult the Jupyter notebooks that accompany the code.

Download issues (manual download):

Although the process of downloading FITS files for the vector magnetogram data can be performed automatically in ARTop, this may not work if there are connections issues. Such issues can arise if there are problems at the JSOC end or if your connection speed is low.

A practical solution is to perform a manual download. This is selected by setting 'Download data=manual' in read_data.txt.

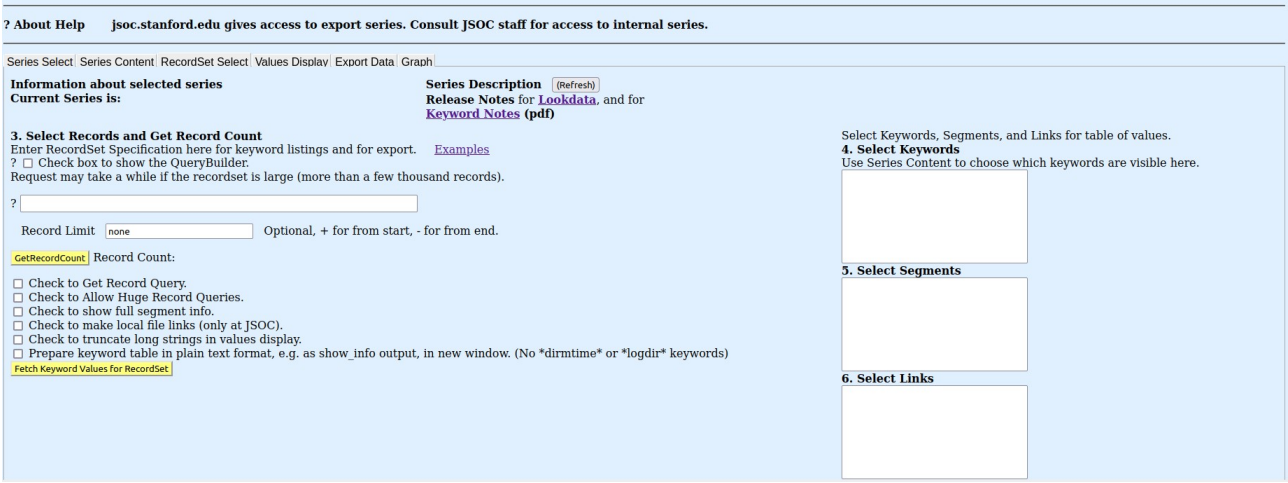
To make this work, first you need to create the input directory. Then you need to place a tar file containing all the FITS files of the components of the vector magnetograms ARTop will then extract these files and process them.

ARTop makes use of a tar file as JSOC recommend this method of downloading data, in order to not overrun their servers.

If the automatic download fails, you can get the tar file you need via the following process:

Step 1:

Go to http://jsoc.stanford.edu/ajax/lookdata.html and click on the 'RecordSet Select' tab. You should see something like this:



Step 2:

In the text box to the right of the question mark (above Record Limit), enter your search criteria. An example is:

hmi.sharp_cea_720s[3563][2014.01.06_23:45-2014.01.07_0:14]{Bp,Br,Bt}

The number in the first set of brackets is the SHARP number. In the second set of square brackets, is the time range that you wish to search.

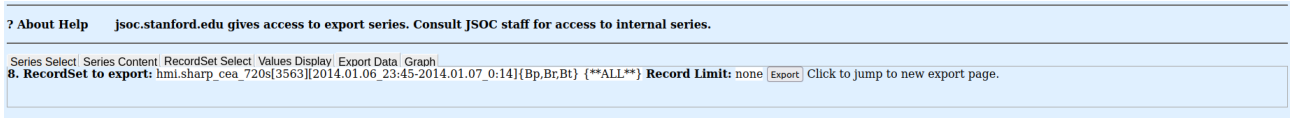
In the curly brackets are the three components of the magnetic field. Each component at each time dump will have its own FITS file.

Step 3:

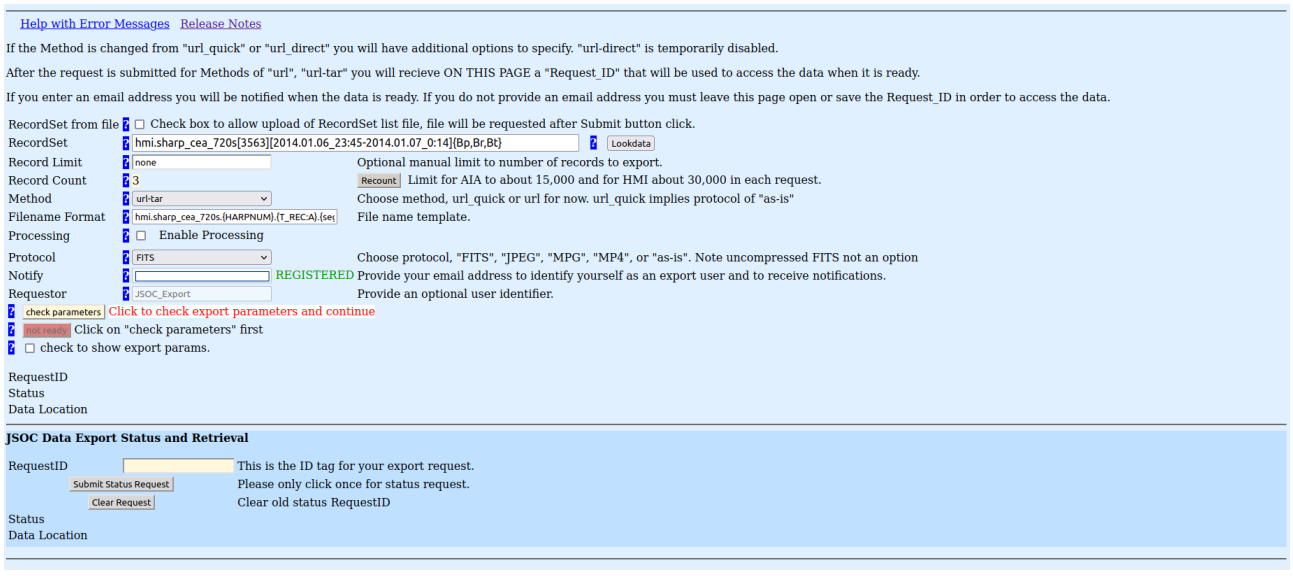
After entering the search data in the correct format, click ‘GetRecordCount’. If the number that appears beside it is zero, this means you’ve chosen the wrong time period for the specified active region, and you’ll need to adjust your search.

Assuming that files have been found, you can click on the ‘Values Display’ tab (beside ‘RecordSet Select’) to see a list of the files.

Now click on the ‘Export Data’ tab. You should see something like:



Now click ‘Export’. This will take you to another screen and you should see:



Make sure that ‘Method’ is set to ‘url-tar’ and enter your registered email address beside ‘Notify’. Then click ‘check parameters’. If everything is in order, click ‘submit’ and then ‘Submit Status Request’ to see the link to the tar file onscreen. You will also be emailed this link.

You now have a tar file and you can follow the instructions at the start of this document to use this file as input for ARTop.