- Added by Bill Rideout, last edited by Bill Rideout on Jul 17, 2022 13:48 (view change)

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Madrigal 2022 Exercise 1: Using the web interface

Selected Madrigal 3 site:

- CEDAR Madrigal archive site

Data Access -> List Experiments

In the List Experiments, you can list experiments to choose from. This interface allows you to look either at ALL Madrigal sites, or just the local one.

1. **Choose Data Access -> List experiments from either of the two Madrigal sites listed above.**
2. If this is the first time you have used Madrigal, you will be redirected to a page where you set up a cookie with your name, email, and affiliation. Madrigal does not require passwords, but your data downloading is logged based on your cookie. When you have finished with that form, again choose Data Access -> List experiments.
3. Uncheck "Use all Madrigal sites" selected so you only search over this Madrigal site.
4. For "Instrument category" choose "Incoherent Scatter Radars".
5. Briefly look through the list of incoherent scatter radars for which there is data on Madrigal.
6. Select the "Millstone Hill IS Radar", and for a time period choose February 2019. Then hit "List experiments".
7. You will notice that every time period is repeated three times. There is a standard experiment, a plasma line experiment, and a "Alternate processing using USRP receiver - not for science use". Ignore the Alternate experiment, and only use the plasma line and standard experiments.
8. Choose the standard version of the Feb 2, 2019 experiment with experiment name "World Day - Bubbles".
9. Look at the top line. This lists the principle investigator of this data set. **Contact them as soon as you consider using their data in a paper!** If you are really interested in an experiment or an instrument, you can sign up to be notified when that experiment or instrument is updated.
10. Click on the "Select file" pull-down menu. You will notice there are numerous different files associated with this experiment. This is explained in detail in the Millstone Hill overview document. Basically there is a combined file, and then smaller files with subsets of that combined files, along with derived velocity files and a gridded file where complex measurements are reduced to a standard grid for use by modelers. For now choose the "Combined basic parameters file" listed first.
11. Choose the "Show Plots" button. This will list all the plots and other documentation the instrument principal investigator added to Madrigal to help users understand the data. For this experiment, choose "Summary plots - electron density".
12. In this experiment, the steerable antenna was pointing one way, and the zenith was pointing straight up (it is not steerable). Each radar is running two modes - single pulse and alternating code. The alternating code has better spatial resolution, and so is used to plot the E region. The single pulse goes higher, and so is used in the F region plot.
13. Select the "View File Info" button. This will list the descriptive text embedded in the Hdf5 or netCDF4 versions of this file.
14. Select the "Cite this file" button. This will create a full citation with a permanent w3id.org based url which can be used as a data citation in a publication that uses this data file.

15. Click the "Download File" button. You will see two options "As is" and "Select parameters/filters". For now select "As is". This means you are downloading the file as created the instrument principal investigator. This offers less flexibility than "Select parameters/filters" but is often much faster.
16. Choose any of the three formats, and download that file.

Data Access -> Select Single Experiment

In select single experiment, you will be guided to a single experiment to examine, rather than seeing a list of experiments. This interface allows you to look either at **ALL** Madrigal sites, or just the local one.

1. Choose Data Access -> Select single experiment.
2. Leave "Use all Madrigal sites" selected so you search over all Madrigal sites.
3. For "Instrument category" choose choose "Fabry-Perots".
4. Select the "Arecibo Imaging Doppler Fabry-Perot".
5. Select year 2018, month January, and day 15.
6. Note that from this point on, the options are similar to the List experiment user interface.
7. This time we will print the file with and without filters. Select the one file listed, then choose "Print file" and "As is".
8. Next we will print the file, but filter by data quality. To learn about data quality, choose "Show plots" and "Description of data quality (FPI_DATAQUAL) parameter".
9. Next choose "Print file" and "Select parameters/filters".
10. Open the "Select Parameters to include" section by clicking on it.
11. Click or hover on any of the parameters to see its definition.
12. You could select any parameters to print, including derived ones in grey. For now select just the parameters in the file by clicking "Select all parms in original file" at the top.
13. Close "Select Parameters to include" section by clicking on it, and open "Select filters to use (optional)".
14. In the bottom section select or type "FPI_DATAQUAL" as the filter parameter. Leave the lower limit blank, and set the upper limit to 0. This will remove all data with values above 0.
15. Verify the resultant output only has values of 0 for FPI_DATAQUAL.

Metadata Access

All the metadata in Madrigal can be browsed in this section. Briefly glance at each option. The Filter String metadata is information only needed when users are writing advanced scripts to download data.

Run Models

1. **Choose `Run Models->Run Madrigal derivation engine.` This page allows user to directly run the Madrigal derivation engine. Use this page to calculate the shadow height (SDWHT) in the Geographic Coordinate parameters section, and magnetic field vector (BN,BE,BD) parameters from the Magnetic Coordinate parameters section. Look at a single point 1000 km directly above PFISR (lat 65.130, lon -147.471) at 2007-03-27 12:00:00 UT.**
2. The Run models -> looker section is optional. This section derivers parameters that depend on a look direction, such as would be relevant to radar measurements.
3. The Run models -> ISR empirical models section allows you to run an empirical model to predict the conditions around a number of ISR radars. Try it by clicking Run under Millstone Hill Radar

Models. Leave all defaults, and select RUN. Select "Local time Variation" and click "generate plots".

Labels

- None