

SDO/EVE Level 0C Spectra

Brian Templeman 05/17/2013

1) Data description

The EVE level 0C 1 minute averaged spectra are derived from 10 second samples obtained from MEGS A and MEGS B. The raw images are crudely calibrated and averaged to produce spectral irradiances with less than 15 minute latency. The spectra contain wavelengths from 5.81nm to 106.17nm in increments of 0.02nm. These data are a space weather product and should not be used for science research. EVE level 2 and level 3 products, which include better calibrated solar EUV irradiance spectra, are recommended for science research.

2) Downloading the data

The level 0CS data are available for download at:

http://lasp.colorado.edu/eve/data_access/evewebdata/products/level0c/SPECTRA/

The data are stored in ASCII format by year with file names in the form of:

EVS_L0C_2013128_003.txt.gz.

The EVS_L0C stands for EVE spectra level 0c data, then followed by the year and day of year. This is followed by the EVE data product version number. These files contain a full days worth 1 minute averaged spectra (1440 entries) and header information describing data units and other important information. The files are compressed with gzip to decrease disk usage and download time. If using these data with any code other than the reader described below, the files might have to be decompressed first. Gzip is free software and available for all operating systems. The program may be downloaded from: <http://www.gzip.org/>

3) Download the reader software

The ASCII text files can be viewed by any text editor after unzipping. For IDL users, a reader is available for download at:

http://lasp.colorado.edu/eve/data_access/software/eve_read_l0c_spectra.pro

This reader will read in the given file and returns the data in a structure. The reader will handle compressed files and an option exists to create a series of lines derived from the spectral data. The definitions of these lines are also returned. It will also read a 'latest_EVS_L0C.txt' file by supplying a /latest keyword on the command line. The 'latest' file has a slightly different format than the daily files so the /latest keyword is used to notify the code that the given file is a latest 15 minute data file.

4) Example use of the data

The following example is for IDL using the above reader software. First step is to read in the data file:

```
IDL> data = eve_read_l0c_spectra( "EVS_L0C_2013129_003.txt.gz", /lines )
```

```
IDL>HELP,data,/STR
**Structure<cc14e3a8>,10tags,length=29109048,datalength=29109044,refs=1:
YEARINT2013
DOYINT129
MONTHINT5
DOMINT9
HHMMINTArray[1440]
MINOFDAYINTArray[1440]
WAVELENGTHFLOATArray[5019]
SPECTRAFLOATArray[1440,5019]
LINE_IRRADIANCEFLOATArray[1440,30]
LINE_DEFINITIONSSTRUCT->LINE_STRUCT_AArray[30]
```

```
IDL>HELP,data.LINE_DEFINITIONS,/STR
**StructureLINE_STRUCT_A,5tags,length=32,datalength=32:
WAVELENGTHFLOAT9.39260
LOW_WAVEFLOAT9.33000
HIGH_WAVEFLOAT9.43000
LOG_TEMPFLOAT6.81000
IONSTRING'FeXVIII'
```

Now one can plot one of the 1-minute averaged spectra:

```
IDL> plot, data.wavelength, data.spectra[50,*], /ylog, yrange=[1e-7,1e-1], charsize=1.5, $
      xtitle='Wavelength (nm)', ytitle='Irradiance (W/m^2/nm)'
```

This produces the following plot:

