Chandra X-ray Center

URL: http://cxc.harvard.edu/ciao3.4/slds9.html
Last modified: December 2006

AHELP for CIAO 3.4

ds9

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Synopsis

A simple S−Lang interface to ds9

Description

The ds9 package provides a set of S−Lang functions for interacting with ds9 which are based on the XPA module (see "ahelp xpa").

The functions can be loaded using either of the following statements:

```
 require ("ds9");
 () = evalfile ("ds9");
```

Functions provided by the module

The following functions are provided by the pckage; use "ahelp <function>" to get a detailed description of a function:

- ds9_launch
- ds9_view
- ds9_quit
- ds9_clear
- ds9_center
- ds9_get_cmap and ds9_set_cmap
- ds9_get_coords
- ds9_get_crosshair and ds9_put_crosshair
- ds9_get_array and ds9_put_array
- ds9_get_file and ds9_put_file
- ds9_get_regions and ds9_put_regions
- ds9_get_scale and ds9_put_scale
- ds9_put_wcs, ds9_put_wcs_keys, and ds9_put_wcs_struct
- ds9_pan
- ds9_get_zoom and ds9_set_zoom

Example 1

```
chips> require ("ds9")
chips> ds9_view ("acisf03662N001_evt2.fits")
```

Here we load in the ds9 package and then use it to start up a ds9 − if one is not running − and get it to view a file. The ds9_put_file() command can be used to change the file being displayed:

```
chips> ds9_put_file ("expmap.fits")
```

Example 2

```
chips> () = ds9_launch
chips> ds9_put_array ([1:512*512])
```

Here we use the package to send an array (the numbers 1 to 512*512) to ds9 for display. We can also read the data from ds9, which provides the possibility for manipulating the ds9 display:

```
chips> img = ds9_get_array
chips> img
Integer_Type[512,512]
chips> ds9_put_array (sqrt (img))
```

WORLD COORDINATE SYSTEMS

The routines default to treating images as arrays of raw pixel values. It is also possible to attach coordinate systems to these arrays to define the mapping between pixel number and the desired physical coordinate system.

From a text file

If the text file image.wcs contains

```
CRPIX1  256
CRVAL1  512
CDELT1  2
CTYPE1  X
CRPIX2  256
CRVAL2  512
CDELT2  2
CTYPE2  y
```

then it can be used by saying

```
chips> ds9_view ([1:512*512])
chips> ds9_put_wcs_keys ("image.wcs")
```

As a string array

The numeric values for the transform can also be supplied as an eight−element string−array. For example:

```
chips> wcs = String_Type [8]
chips> wcs[[0:3]] = ["CRPIX1 256","CRVAL1 512","CDELT1 2","CTYPE1 X"]
chips> wcs[[4:7]] = ["CRPIX2 256","CRVAL2 512","CDELT2 2","CTYPE2 Y"]
chips> ds9_put_wcs_keys ("image.wcs")
```

Numeric arrays

The WCS values can also be set using numeric arrays:

```
chips> crpix = [256,256]
chips> crval = [512,512]
chips> cdelt =[2,2]
chips> ds9_put_wcs (crpix, crval, cdelt)
```

As a structure

The WCS values can also be specified using a S−Lang struct:

```
chips> s = struct { crpix, crval, cdelt, ctype, cunit }
chisp> s.crval = [256,256]
chips> s.crval = [512,512]
chips> s.cdelt =[2,2]
chips> ds9_put_wcs_struct (s)
```

Removing the WCS

The coordinate transformation can be cleared by saying:

```
chips> ds9_put_wcs_keys ("")
```

CHANGES IN CIAO 3.2

This package is new to CIAO 3.2. It can only be used when the CIAO 3 compatability mode of the XPA module is not in use (see "ahelp xpa" for more information on this mode). This means that this package will not work correctly in Sherpa in CIAO 3.2.

See Also

ds9

ds9_center, ds9_clear, ds9_get_array, ds9_get_cmap, ds9_get_coords, ds9_get_crosshair, ds9_get_file, ds9_get_regions, ds9_get_scale, ds9_get_zoom, ds9_launch, ds9_pan, ds9_put_array, ds9_put_crosshair, ds9_put_file, ds9_put_regions, ds9_put_wcs, ds9_put_wcs_keys, ds9_put_wcs_struct, ds9_quit, ds9_set_cmap, ds9_set_scale, ds9_set_zoom, ds9_view

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