**Chandra X-ray Center**

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*AHELP for CIAO 3.4*　　　**pix_dmTanWorldToPix**　　　Context: pixlib

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# Synopsis

Convert from World (celestial) to FPC coordinates by applying an aspect solution.

# Syntax

```
Array_Type pix_dmTanWorldToPix( Array_Type world, Array_Type asp,
Array_Type crpix, Array_Type cdelt )
```

# Description

This routine converts a position in the World (Celestial) coordinate system to the Focal Plane coordinate (FPC) system. To perform this conversion the routine needs to know the aspect solution, knowledge of where the telescope was pointing at the time the photon was detected. The FPC system corresponds to the ( DETX, DETY ) columns of a Chandra event file.

The world position (the world argument) is given as a two−element array in units of degrees. The pointing position is given in the three−element array asp, which should contain the ra, dec, and roll values in degrees. The crpix argument is a two−element array which gives the pixel location for the aimpoint. The cdelt argument is also a two−argument array and gives the pixel size in degrees. For the ACIS detectors you would use

```
crpix = [ 4096.5, 4096.5 ]
```

```
cdelt = [ −0.492, 0.492 ] / 3600.0
```

The return value is a two−element array which gives the FPC coordinates in pixels.

# Example

```
chips> require("pixlib")
chips> require("paramio")
chips> pix_init_pixlib
chips> evt = readfile( "acis_evt2.fits[cols ra,dec]" )
chips> wcspos = [ evt.RA[0], evt.DEC[0] ]
chips> !dmkeypar acis_evt2.fits ra_nom
chips> ra_nom = pget( "dmkeypar", "value" )
chips> !dmkeypar acis_evt2.fits dec_nom
chips> dec_nom = pget( "dmkeypar", "value" )
```

```
chips> !dmkeypar acis_evt2.fits roll_nom
chips> roll_nom = pget( "dmkeypar", "value" )
chips> asp = [ ra_nom, dec_nom, roll_nom ]
chips> crpix = [ 4096.5, 4096.5 ]
chips> crdelt = [ -0.492, 0.492 ] / 3600
chips> detpos = pix_dmTanWorldToPix( wcspos, asp, crpix, crdelt )
```

In this example we have used the pix_dmTanWorldToWorld() routine to convert the celestial position of the first event in acis_evt2.fits into the detector position it would have using the nominal pointing position.

We used the dmkeypar tool to get the RA_NOM, DEC_NOM, and ROLL_NOM keywords from the header of the acis_evt2.fits file. Since dmkeypar stores the keyword in its parameter file as the "value" parameter, we use the pget() function – from the paramio module – to read these values into S–Lang variables.

# Bugs

See the bugs page for the pixlib library on the CIAO website for an up–to–date listing of known bugs.

# See Also

*modules*
        pixlib
*pixlib*
        pix_apply_aspect, pix_deapply_aspect, pix_dmtanpixtoworld, pix_dmtanworldtopix