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*AHELP for CIAO 3.4*

# reproject\_image

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## Synopsis

Projects image from one WCS to another

## Syntax

```
reproject_image infile matchfile outfile [resolution] [method]
[coord_sys] [lookupTab] [clobber] [verbose]
```

## Description

'reproject\_image' maps an image in one WCS reference frame to another. For each output pixel in the matchfile it maps an n-point polygon onto the input image via the WCS transforms. The area of each pixel covered in the input image is then used to compute the output pixel value.

'reproject\_image' can be used to project an image w/ one target point to another target point as is useful when merging multiple observations or when matching data across missions.

Any Null/NaN valued pixels or pixels outside the data-subspace or pixels outside the input image are assigned a value = 0.

## Example 1

```
reproject_image img.fits matchfile=new_tan.fits outfile=reproject.fits
```

The output image will have the same size and WCS as the 'matchfile' file. Each pixel in 'matchfile' will be mapped to pixels in the 'infile'.

## Example 2

```
reproject_image XMM.fits matchfile=Chandra.fits outfile=myout.fits
```

Projects an XMM file to the same WCS (target–point) as a Chandra image.

## Example 3

```
reproject_image @img.lis matchfile=new_tan.fits outfile=reproject.fits
```

Similar to first example but uses a stack as input. Each input image is reprojected to the output coord system. The images are then co-added. The 'method' normalization is applied before the data are summed.

## Parameters

name	type	ftype	def	min	max	reqd
<u>infile</u>	file	input				yes
<u>matchfile</u>	file	input				yes
<u>outfile</u>	file	output				yes
<u>resolution</u>	integer		1	0		
<u>method</u>	string		sum			
<u>coord_sys</u>	string		world			
<u>lookupTab</u>	string					no
<u>clobber</u>	boolean		no			
<u>verbose</u>	integer		0	0	5	

## Detailed Parameter Descriptions

**Parameter=infile (file required filetype=input)**

*The input image.*

The input 2D image.

**Parameter=matchfile (file required filetype=input)**

*The reference image.*

The 'infile' image is mapped to the same WCS as this image. The 'outfile' will have the same dimensions and WCS as this image.

**Parameter=outfile (file required filetype=output)**

*The output file name*

Contains the reprojected image.

**Parameter=resolution (integer default=1 min=0)**

*Controls quality of projection; number of points per side of polygon*

An n-sided polygon that outlines the output pixel is mapped to input image via the WCS transforms. The number of points along each side of the pixel is the resolution parameter. A value of '1' indicated that just the corners of the pixel will be used. A value of '2' indicates that the corner and the middle of the pixel-edge line segments will be use. And so on. The more points on the polygon, the better the polygon will approximate the possibly non-linear transform between the images. However, the more points on the polygon, the longer the run-time of the tool.

A value of '0' can also be used. This is a special quick mode that simply maps the center output pixel to a single input pixel and uses that value in the output image. This can be done very quickly; however, when something other than a simple shift of the images is need this can result in image artifacts (for example aliasing or 'dead' regions). Also the 'method' is not applicable in this useage. The output image is essentially "interpolated", so if the pixel scales are different the flux will not be preserved.

**Parameter=method (string default=sum)**

*Controls output normalization*

The output image can either represent a conservation of "sum" ( integral over an apperture on the input and output image would give same value) or it can represent an "average" where the output pixel value represents an average input value.

Typically users will use "sum" to reproject the COUNTS image and will use "average" to reproject the EXPOSURE image when making fluxed images.

**Parameter=coord\_sys (string default=world)**

*Coordinate system to do the pixel mapping in*

Currently only "world" coordinate system is supported. Logical pixels in the output image are mapped to physical pixels which are then mapped to world coordinate (RA,Dec). These are then mapped back to physical pixels in the input image and then back to image pixels in the input image. [TBD: implement "physical" and "image" coord sys's]

**Parameter=lookupTab (string not required)**

*The header merging table*

Rules to merge the headers when more than one file supplied. If set to NONE or a blank string then the header from the first file is used.

**Parameter=clobber (boolean default=no)**

*Remove output if it exists?*

Used to specify whether or not to clobber existing file that has the same name as the specified output file

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**Parameter=verbose** (integer default=0 min=0 max=5)

*The tool chatter level*

Verbose can be from 0 to 5, generating different amounts of debugging output.

## Bugs

See the [bugs page for this tool](#) on the CIAO website for an up-to-date listing of known bugs.

## See Also

*tools*

[dmcoords](#), [reproject\\_events](#), [reproject\\_image\\_grid](#), [skyfov](#)

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URL:  
[http://cxc.harvard.edu/ciao3.4/reproject\\_image.html](http://cxc.harvard.edu/ciao3.4/reproject_image.html)  
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