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*AHELP for CIAO 3.4*

## tg\_scale\_reg

Context: [tools](#)

*Jump to:* [Description](#) [Examples](#) [Parameters](#) [NOTES](#) [Bugs](#) [See Also](#)

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### Synopsis

Create a region file that labels distances along the grating arm

### Syntax

```
tg_scale_reg infile outfile x y rot_ang grating instrument [script]
[scale] [values] [verbose]
```

### Description

It can be useful to visualize the wavelengths or energies directly on the sky image of a grating observation, e.g. to see what the chip coverage is or where contaminating sources lie. `tg_scale_reg` creates an ASCII region file which annotates the dispersion distance along the grating arm in wavelength or energy units.

There are two methods for running the script:

- Using a FITS region file as input: only the "infile" and "outfile" parameters are required.
- Without an input file: in the case where a FITS file is not available, the input information can be provided by the "x", "y", "rot\_ang", "grating", and "instrument" parameters. The "outfile" is still required.

This script is used in the [Measure Grating Dispersion Distance thread](#).

### Example 1

```
tg_scale_reg acisf01010N001_evt2.fits wave_1010.reg
```

The script is run with a FITS file for input, so only an output file name must be specified. The REGION block appended to `acisf01010N001_evt2.fits` is used to create the output ruler file. The default scale and values are used.

## Example 2

```
tg_scale_reg infile="" outfile=meg_energy.reg x=4101 y=4089
rot_ang=262.65257 grating=meg instrument=acis scale=kev
```

The source position, rotation angle, grating arm, and instrument were obtained from an event file header and are used instead of setting the "infile" parameter. The scale will be in energy [keV] instead of wavelength.

## Parameters

name	type	ftype	def	min	max	reqd
<u>infile</u>	file	input				yes
<u>outfile</u>	file	output				yes
<u>x</u>	real	input				yes
<u>y</u>	real	input				yes
<u>rot_ang</u>	real	input				yes
<u>grating</u>	string	input	leg			yes
<u>instrument</u>	string	input	acis			yes
<u>script</u>	file	input				
<u>scale</u>	string	input	angstrom			
<u>values</u>	string	input				
<u>verbose</u>	integer		0	0	5	

## Detailed Parameter Descriptions

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

*Input FITS file*

The input file must be a grating evt1a.fits or evt2.fits file that has a REGION block extension (created by tg\_create\_mask and appended to the file by tg\_resolve\_events).

This parameter is not required when running the script by specifying the "x", "y", "rot\_ang", "grating", and "instrument" parameters.

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

*Output filename*

The output is an ASCII region file that can be displayed over the data in ds9.

**Parameter=x (real required filetype=input)**

*x source position in sky coordinatess*

This parameter is not required if an "infile" is provided.

**Parameter=y (real required filetype=input)**

*y source position in sky coordinatess*

This parameter is not required if an "infile" is provided.

**Parameter=rot\_ang (real required filetype=input)**

*Rotation angle*

The roll angle for the observation, which is stored in the ROLL\_NOM header keyword.

This parameter is not required if an "infile" is provided.

If you are working with a multiobi dataset, the ROLL\_NOM value in the merged evt2 file may not produce truly accurate results from this script. For the most reliable grating scale, run tg\_scale\_reg.sl on each evt1a dataset. It is also possible to use the command line method, substituting the ROLL\_PNT header keyword value where ROLL\_NOM is used in the example.

**Parameter=grating (string required filetype=input default=leg)**

*Grating arm*

Allowed values are "leg", "hetg", "heg", or "meg". If "hetg" is used, the output file will contain information for both the HEG and MEG arms.

This parameter is not required if an "infile" is provided.

**Parameter=instrument (string required filetype=input default=acis)**

*Instrument used for the observation*

Allowed values are "acis" or "hrc".

This parameter is not required if an "infile" is provided.

**Parameter=script (file filetype=input)**

*S-Lang script with tg\_scale\_reg() function*

tg\_scale\_reg is an slsh wrapper that allows tg\_scale\_reg.sl to be run from the command line. This parameter defines the location of tg\_scale\_reg.sl.

The default value of the script parameter is set for the standard CIAO scripts installation:  
\${ASCDS\_CONTRIB}/share/slsh/local-packages/tg\_scale\_reg.sl

Parameter=x (real required filetype=input)

**Parameter=scale** (string filetype=input default=angstrom)

*Distance units for the scale*

Allowed values are "keV" or "angstrom".

**Parameter=values** (string filetype=input)

*Comma-separated list of the values to be annotated*

This parameter allows the user to customize which energies or wavelengths are marked on the scale. For instance, setting values="1.0 2.0 3.0 4.0 5.0" with an energy scale will place a marker at 1 keV intervals from 1–5 keV.

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

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

## NOTES

This script is not an official part of the CIAO release but is made available as "contributed" software via the [CIAO scripts page](#). Please see the [installation instructions page](#) for help on installing the package.

## Bugs

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

## See Also

*tools*

[dmtypesplit](#), [tg\\_create\\_mask](#), [tg\\_resolve\\_events](#), [tgdetect](#), [tgextract](#), [tgidselectsrc](#), [tgmatchsrc](#)

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URL:  
[http://cxc.harvard.edu/ciao3.4/tg\\_scale\\_reg.html](http://cxc.harvard.edu/ciao3.4/tg_scale_reg.html)  
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