



 AHELP for CIAO 3.4

eqwidth

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Synopsis

Computes the equivalent width of an emission or absorption line in source or background data.

Syntax

```
sherpa> [B]EQWIDTH [# [ID]] (<continuum_stack>,
<continuum_plus_line_stack>)
```

EQWIDTH is used for computing equivalent widths in source datasets, while BEQWIDTH is used for computing equivalent widths in background datasets.

specifies the dataset over which the source model is evaluated. The ID modifier is used only for computing background dataset equivalent widths, and then if and only if the Sherpa state object variable multiback is set to 1, i.e., if more than one background dataset is to be associated with a single source dataset. The ID modifier may be any unreserved string (e.g., A, foo, etc.), i.e., a string that is not a parsable command.

<continuum_stack> represents one or more models (or user-defined model stacks) that describe the continuum, while <continuum_plus_line_stack> represents two or more models (or user-defined model stacks) that describe the continuum plus line.

Description

To compute the equivalent width, an integral over the energy/wavelength range of the dataset is performed. At each point, the <continuum_stack> (C) and <continuum_plus_line_stack> ([C+L]) are evaluated; the integrand is then $([C+L] - C) / C$.

The models are specified on-the-fly in the same manner that SOURCE or BACKGROUND model stacks are defined, as algebraic combinations of previously defined model components. The examples below illustrate this point. The user must specify the models in this manner, because (a) Sherpa cannot identify whether a particular model component should be associated with the continuum or with the line, and (b) multiple line components may be specified in the SOURCE model stack, so that it cannot be used in place of <continuum_plus_line_stack> to compute equivalent widths.

Equivalent widths may also be computed using the Sherpa/S-Lang module functions `get_eqwidth` and `get_beqwidth`.

Example 1

Model a continuum and emission line complex using a power-law and normalized Gaussian, then compute the equivalent width:

```
sherpa> SOURCE = POW[cont]+NGAUSS[eline]
...
sherpa> FIT
...
sherpa> EQWIDTH 1 (cont,cont+eline)
EW = 0.535073 keV
```

Example 2

Define continuum and line model stacks; use these in the equivalent width calculation:

```
sherpa> BBODY[modela]
sherpa> POWLAW1D[modelb]
sherpa> NGAUSS[line1]
sherpa> NGAUSS[line2]
sherpa> NGAUSS[line3]
...
sherpa> CONT = modela+modelb
sherpa> ELINE = line1
sherpa> SOURCE = CONT + ELINE + line2 + ...
sherpa> FIT
...
sherpa> EQWIDTH 1 (CONT,CONT+ELINE)
EW = 0.454946 keV
```

Bugs

See the [Sherpa bug pages](#) online for an up-to-date listing of known bugs.

See Also

chandra

[guide](#)

sherpa

[bye](#), [calc](#), [kcorr](#), [dataspace](#), [dcounts](#), [dollarsign](#), [echo](#), [eflux](#), [erase](#), [flux](#), [get](#), [get dcounts sum](#), [get dir](#), [get eflux](#), [get eqwidth](#), [get filename](#), [get flux2d](#), [get flux str](#), [get lfactorial](#), [get mcounts sum](#), [get pflux](#), [get source components](#), [get verbose](#), [groupbycounts](#), [guess](#), [is](#), [journal](#), [list](#), [list par](#), [mcounts](#), [numbersign](#), [paramest](#), [plot eprof](#), [plot rprof](#), [prompt](#), [reset](#), [run](#), [set](#), [set analysis](#), [set axes](#), [set coord](#), [set dataspace](#), [set dir](#), [set verbose](#), [setplot](#), [sherpa-module](#), [sherpa_plotfns](#), [sherpa_utils](#), [show](#), [simspec](#), [use](#), [version](#)

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URL:
<http://cxc.harvard.edu/ciao3.4/eqwidth.html>
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