



AHELP for CIAO 3.4

freeze

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Synopsis

Prohibits model parameter(s) from varying.

Syntax

```
sherpa> FREEZE <arg_1> [<arg_2> ...]
```

Description

<arg> may be:

FREEZE Command Arguments

Argument	Description
<sherpa_modelname>.{<paramname> <#>}	Freezes the specified model component parameter.
<modelname>.{<paramname> <#>}	Freezes the specified model component parameter.
<sherpa_modelname>	Freezes all parameters of the specified model component.
<modelname>	Freezes all parameters of the specified model component.
<sherpa_model_stack> [# [ID]]	Freezes the parameters of all model components within the specified model stack (SOURCE, BACKGROUND, PILEUP, [B]NOISE, or KERNEL). # is a dataset number (default 1); see BACKGROUND for an explanation of ID.
<model_stack>	Freezes the parameters of all model components within the user-defined model stack.

The command THAW is used to allow model parameter values to vary.

In addition, model parameters may be frozen using the equivalent command

- `sherpa> <modelname>.{<paramname>|<#>}.TYPE = FREEZE`

If model parameter prompting is enabled, the user may freeze a parameter by entering [`<value>:<min>:<max>`],-1 at the prompt; the -1 sets the parameter to be frozen.

Model parameters may also be frozen using the Sherpa/S–Lang module functions `set_frozen` and `set_par`.

Example 1

Freeze a model parameter:

```
sherpa> PARAMPROMPT OFF
sherpa> GAUSS[modelb]
sherpa> FREEZE modelb.ampl
```

The last command freezes the parameter `ampl` of `modelb`.

Example 2

Thaw a model parameter and freeze a model parameter:

```
sherpa> THAW modelb.3
sherpa> FREEZE modelb.3
```

The first command thaws the third parameter of `modelb`. The last command freezes the third parameter of `modelb`.

Example 3

Thaw all model parameters and freeze two model parameters:

```
sherpa> THAW modelb
sherpa> FREEZE modelb.fwhm modelb.pos
```

First, all parameters of `modelb` are thawed. The last command then freezes the `fwhm` and `pos` parameters of `modelb`.

Example 4

Freeze or thaw all source component parameters at once:

```
sherpa> PARAMPROMPT OFF
Model parameter prompting is off
sherpa> POW[modelc]
sherpa> GAUSS[modelf]
sherpa> SOURCE 2 = modelc + modelf
sherpa> FREEZE SOURCE 2
sherpa> SHOW SOURCE 2
Source 2:

(modelc + modelf)
powlawld[modelc] (integrate: on)
  Param  Type      Value      Min      Max      Units
  -----  ----  -----  ----  ----  -----
  1  gamma frozen      1      -10      10
  2   ref frozen  1-3.4028e+38  3.4028e+38
  3  ampl frozen      1      1e-20  3.4028e+38
gaussld[modelf] (integrate: on)
  Param  Type      Value      Min      Max      Units
  -----  ----  -----  ----  ----  -----
  1  fwhm frozen    10  1.1755e-38  3.4028e+38
  2   pos frozen    0-3.4028e+38  3.4028e+38
  3  ampl frozen    1-3.4028e+38  3.4028e+38
```

```

sherpa> THAW SOURCE 2
sherpa> SHOW SOURCE 2
(modelc + modelf)
powlaw1d[modelc] (integrate: on)
  Param   Type      Value      Min      Max      Units
  -----
  1  gamma thawed      1      -10      10
  2   ref frozen 1-3.4028e+38 3.4028e+38
  3  ampl thawed      1      1e-20 3.4028e+38
gauss1d[modelf] (integrate: on)
  Param   Type      Value      Min      Max      Units
  -----
  1  fwhm thawed    10 1.1755e-38 3.4028e+38
  2   pos thawed    0-3.4028e+38 3.4028e+38
  3  ampl thawed    1-3.4028e+38 3.4028e+38

```

This example illustrates the use of `FREEZE SOURCE` and `THAW SOURCE` to freeze and thaw all source component parameters at once, respectively. Note that thawing of some model parameters (e.g., `POWLAW1D.ref`) is not permitted.

Example 5

Freeze a model parameter:

```
sherpa> modelb.ampl.TYPE = FREEZE
```

This command freezes the parameter `ampl` of `modelb`. The following commands are each equivalent:

```

sherpa> modelb.3.TYPE = FREEZE
sherpa> FREEZE modelb.ampl
sherpa> FREEZE modelb.3

```

Example 6

Freeze model parameters:

```

sherpa> ERASE ALL
sherpa> PARAMPROMPT ON
Model parameter prompting is on
sherpa> GAUSS[modelb]
modelb.fwhm parameter value [10] 2,-1
modelb.pos parameter value [0] ,-1
modelb.ampl parameter value [1]
sherpa> SHOW modelb
gauss1d[modelb]
  Param   Type      Value      Min      Max      Units
  -----
  1  fwhm frozen      2 1.1755e-38 3.4028e+38
  2   pos frozen    0-3.4028e+38 3.4028e+38
  3  ampl thawed    1-3.4028e+38 3.4028e+38

```

In this example, parameters are frozen by entering `<value>`, `-1` at the model parameter value prompt. Note that `, -1` at the model parameter value prompt accepts the given initial parameter value and freezes that parameter.

Example 7

Freeze all model parameters at once; thaw all source parameters at once:

```
sherpa> PARAMPROMPT OFF
Model parameter prompting is off
```

```

sherpa> DATA data/example.pha
sherpa> GAUSS[modelc]
sherpa> SOURCE = modelb + modelc
sherpa> FREEZE modelc
sherpa> SHOW SOURCE
(modelb + modelc)
gaussld[modelb] (integrate: on)
  Param  Type      Value      Min      Max      Units
  -----
  1  fwhm frozen    2 1.1755e-38 3.4028e+38
  2   pos frozen    0-3.4028e+38 3.4028e+38
  3  ampl thawed    1-3.4028e+38 3.4028e+38
gaussld[modelc] (integrate: on)
  Param  Type      Value      Min      Max      Units
  -----
  1  fwhm frozen    0.7113     0.0071    71.1283
  2   pos frozen    0.9442     0.0276    14.5494
  3  ampl frozen    0.0001 1.0564e-06 0.0106
sherpa> THAW SOURCE
sherpa> SHOW SOURCE
(modelb + modelc)
gaussld[modelb] (integrate: on)
  Param  Type      Value      Min      Max      Units
  -----
  1  fwhm thawed    2 1.1755e-38 3.4028e+38
  2   pos thawed    0-3.4028e+38 3.4028e+38
  3  ampl thawed    1-3.4028e+38 3.4028e+38
gaussld[modelc] (integrate: on)
  Param  Type      Value      Min      Max      Units
  -----
  1  fwhm thawed    0.7113     0.0071    71.1283
  2   pos thawed    0.9442     0.0276    14.5494
  3  ampl thawed    0.0001 1.0564e-06 0.0106

```

Note that the command FREEZE modelc freezes all parameters of the source model component modelc, while THAW SOURCE thaws all parameters of both source model components.

Bugs

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

See Also

sherpa

[autoest](#), [background](#), [create](#), [create_model](#), [createparamset](#), [fit](#), [get_defined_models](#),
[get_model_params](#), [get_models](#), [get_num_par](#), [get_par](#), [get_stackexpr](#), [getx](#), [gety](#), [guess](#), [instrument](#),
[integrate](#), [is_paramset](#), [jointmode](#), [kernel](#), [lineid](#), [linkparam](#), [mdl](#), [modeexpr](#), [modelstack](#),
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[set_stackexpr](#), [source](#), [thaw](#), [truncate](#), [unlink](#)