

Older Release Notes

v12.5.1 Aug. 2009

- Gain parameters can now be used in the error, freeze, newpar, thaw, and untie commands by prefixing the command name with the letter 'r' (for "response parameter", the more general category to which gain parameters belong). Steppar can now also handle gain parameters. Gain parameters can be displayed either with "show parameter" or the new "show rparameter" option.
- The gain command syntax has changed when using multiple sources. To better conform with the rest of XSPEC, it now requires <source number>:<spectrum number> rather than the reverse.
- Gain parameter limit values can be stored in response files, using the keywords GSLOP_MIN, GSLOP_MAX, GOFFS_MIN, and GOFFS_MAX.
- All input and output data filenames can now include CFITSIO/FTOOLSeextended-syntax for specifying particular HDUs. As a result, XSPEC can now handle files which contain spectra, ARFs and RMFs in multiple extensions.
- Partial derivative calculations during fitting can now be performed numerically rather than with an approximated analytical expression. This option is chosen in the Xspec.init initialization file.
- If a new minimum is found during a steppar run, steppar now prompts the user for acceptance of the new values. Also the delta statistic column of a steppar run is now obtainable with the tclout steppar delstat option.
- The output warning message has been improved in the case where Levenberg-Marquardt fitting runs into a zero diagonal element in the second derivative matrix. Similarly, the more frequent pegged-parameter messages (due to running into hard limits) is now output at higher chatter levels only.
- All calls to the xanlib dynamic memory allocation function udmget have been removed from the Fortran models in XSPEC's models library. The relevant code has been converted to C++. If a user's local models library still requires the udmget code, they'll need to run initpackage with the new -udmget option.
- Additional enhancements previously released as patches to 12.5.0:
 - Setplot wave x-axis units can be toggled from Hz to angstroms through WAVE_PLOT_UNITS entry in Xspec.init file.
 - New tclout gain and sigma options.

- New `xs_getVersion` function available for those linking their own programs to the XSPEC models library.
- The `show parameters` option can now take a range of parameters for displaying subsets.
- All bug fixes to v12.5.0 released as patches a - an are included in v12.5.1. In addition the following problems have been corrected.
 - After running the `ARF` command, any gain previously applied to the associated `RMF` will be removed. Previously it was erroneously applying the gain to the new `ARF`.
 - Additional header file inclusions needed in code files to compile with `g++-4.4.0`
 - Extra line-feed characters removed from Ascii text files in the `modelData` directory. These were causing problems on Solaris 10 w/f90.
 - The `nthcomp` model's internal arrays were hardcoded to a maximum size of 5000 energy bins. The size is now dynamically allocated. (This also affects the `diskir` model.)
 - A Levenberg-Marquardt fit now immediately stops if the fit statistic becomes NaN due to an erroneous model calculation.
 - C++-style comments have been removed from `xsFortran.h` for the benefit of users compiling their own C programs with the models library.
 - Plotting fix for case where "setplot area" is selected and no models are currently loaded.
 - Model parsing fix for case of nested parentheses with no '+' operator, ie. `A(B(C*D))`.

v12.5.0 Nov. 2008

- Two of the remaining unimplemented v11 commands have now been added.
 - **mdfine** allows dynamic definition of models that can be expressed algebraically.
 - `reconrm` has been replaced by the **reconr** model. This allows the correction norm to be treated as a fit parameter, a better solution than the v11 `reconrm` command.

- The complete HTML help files are included in a tar file. These can be made available on a local machine if remote access is now available and selected in the Xspec.init file.
- Convolution components can now operate on multiplicative components. For example, in the model = (CM)A, the convolution component acts on only the multiplicative component. Previously this would have been treated the same as C(MA). The **partcov** partial covering model takes advantage of this new capability.
- There is a new simple way of estimating fluxes (and their errors) from parts of the model. Apply the **cflux** convolution model to the component(s) for which the flux is required.
- The following models have been added as standard
 - **diskir** : irradiated disk
 - **kerrdisk** : broad iron line from a disk around a Kerr BH
 - **nsmax** : NS magnetic atmosphere
 - **nthcomp** : thermally Comptonized continuum
 - **spexpcut** : super-exponential cut-off
 - **swindl** : partially ionized absorbing material with velocity shear
 - **zxipcf** : partial covering of partially ionized absorbing material
 - **cflux** : calculate the flux from model component(s)
 - **kerrconv** : broadening due to rotation around a Kerr BH
 - **partcov** : partial covering modifier for absorption models
 - **simpl** : Comptonization of a seed spectrum
 - **recorn** : Vary the correction file normalization
- The **lrt.tcl** and **simftest.tcl** scripts perform the likelihood ratio and F-tests, respectively.
- The **writefits.tcl** script writes filenames and current fit parameters and errors to a single row of a FITS file. This script can be used as a template for saving other information.

- A response of "/" to a "y/n" prompt will jump out of the current operation and return to the XSPEC command prompt. This is particularly useful for escaping nested fits during an **error** command run.
- The units have been changed for **setplot** wave plots. model and ufspec have a y-axis in photons/cm²/s/Hz, emodel and eufspec in Jy (10⁻²³ erg/cm²/s/Hz), eemodel and eeufspec in erg/cm²/s.
- **Fakeit** can now work with multiple-extension response files. It also works correctly when multiple models are in use (this was release in patch v12.4.0r).
- The active|inactive|options can be applied to the default (unnamed) model (released in patch v12.4.0v).
- Support for GLAST GBM extensions to the standard file formats including multiple response matrix extensions in the same file (released in patch 12.4.0am).
- There are additional diagnostics available at high chatter levels from MCMC **chain** runs. User's custom proposal classes have access to information about acceptances and rejections.
- Initial support for multicore processors using the OpenMP parallel processing compiler option. Multiplication of the model and response is performed in parallel across the multiple spectra in a datagroup.
- All bug fixes to v12.4.0 released as patches a - ar are included in v12.5.0. In addition the following problems have been corrected.
 - When a runtime error is encountered during the calculation of a parameter's error bounds (using the **error** command), the value is now filled in with 0.0 rather than retaining its previous value.
 - **Steppar** will now correctly step in reverse direction if the range values were entered in high-to-low order.
 - Model expression parsing has been improved for nested expressions.
 - Log file output has been fixed so '#' comments are placed correctly.
 - The chi-square calculation includes the **corfile** contribution even if there is no background file associated with the spectrum.
 - There are minor plotting fixes to the confidence line in 1-D steppar/margin plots, the rescaling of the Y=0 green line in lower-panel plots, and the Y-axis label in plot delchi.

- **Tclout** peakrsid no longer fails for a spectrum whose model was not assigned to source 1.
- The XSFunctions library now also depends on XSModel, requiring the addition of a -lXSModel flag to the Makefile of external programs linking with the XSPEC model functions library. (See **Appendix F**)
- The modelIonData model data files directory has been renamed to modelData.
- Portions of some model functions have been translated from Fortran to C++ to reduce use of the udmget memory allocation function. Future versions will remove all references to udmget.