

## ctools - Support #3071

### define a custom spectral model

11/22/2019 05:40 PM - Nigro Cosimo

|  |        |                        |            |
|--|--------|------------------------|------------|
| <b>Status:</b>   | Closed | <b>Start date:</b>     | 11/22/2019 |
| <b>Priority:</b>   | Normal | <b>Due date:</b>       |            |
| <b>Assigned To:</b>  |        | <b>% Done:</b>         | 100%       |
| <b>Category:</b>   |        | <b>Estimated time:</b> | 0.00 hour  |
| <b>Target version:</b>   |        |                        |            |
| <b>Description</b>   |        |                        |            |
| Hello,   |        |                        |            |
| reading through the spectral components available in ctools<br><a href="http://cta.irap.omp.eu/ctools/users/user_manual/models_spectral.html">http://cta.irap.omp.eu/ctools/users/user_manual/models_spectral.html</a><br>it seems that it is not possible to use a custom model.                |        |                        |            |
| What is available in this direction is just a Composite model assembled from the predefined models or a FileFunction that can only be scaled in amplitude.   |        |                        |            |
| As I am trying to reproduce some results from a paper I'd like to have a way to plug the exact same models in the likelihood analysis. More specifically I would like to have a LogParabola with $\log_{10}(E / E_0)$ in the second spectral index and a LogParabola with an exponential cutoff. |        |                        |            |
| What would be the way to proceed?  |        |                        |            |
| Thanks for the support.  |        |                        |            |

### History

#### #1 - 11/22/2019 06:02 PM - Tibaldo Luigi

Hi Cosimo

I am under the impression that you can do what you want with the base models provided in ctools

- regarding the log-parabola defined in terms of  $\beta * \log_{10}$  (reference analysis) vs  $\eta * \ln$  (ctools), you can easily achieve your purpose with the standard ctools models; just remember that  $\beta * \log_{10}(E/E_0) = \beta / \ln(10) \ln(E/E_0)$ , therefore you can compare the ctools results with your reference analysis by a simple multiplication  $\beta = \eta * \ln(10)$  (same goes for the uncertainty);
- for the log-parabola with exponential cutoff perhaps I'm missing your point, but isn't what you are trying to define exactly what you get using the multiplicative type model ([http://cta.irap.omp.eu/ctools/users/user\\_manual/models\\_spectral.html#multiplicative-model](http://cta.irap.omp.eu/ctools/users/user_manual/models_spectral.html#multiplicative-model)) with first component given by a log-parabola ([http://cta.irap.omp.eu/ctools/users/user\\_manual/models\\_spectral.html#log-parabola](http://cta.irap.omp.eu/ctools/users/user_manual/models_spectral.html#log-parabola)) and the second component being the exponential ([http://cta.irap.omp.eu/ctools/users/user\\_manual/models\\_spectral.html#exponential-model](http://cta.irap.omp.eu/ctools/users/user_manual/models_spectral.html#exponential-model)) of a power law with index fixed to 1?

#### #2 - 12/04/2019 03:35 PM - Nigro Cosimo

Hi Luigi

sorry for the belated reply and thanks for the suggestions. I'll try to implement it.

You can close the feature request,

Thanks again.

Cosimo

**#3 - 12/04/2019 03:39 PM - Tbaldo Luigi**

- *Tracker changed from Feature to Support*
- *Status changed from New to Resolved*
- *% Done changed from 0 to 100*

changed category to support and set to solved based on feedback from Cosimo

**#4 - 02/07/2020 04:52 PM - Knödseder Jürgen**

- *Status changed from Resolved to Closed*