

GammaLib - Change request #1821

Revise spectral model names

07/20/2016 03:14 PM - Knödlseeder Jürgen

Status:	Closed	Start date:	07/20/2016
Priority:	Normal	Due date:	
Assigned To:	Knödlseeder Jürgen	% Done:	100%
Category:		Estimated time:	0.00 hour
Target version:	1.1.0		

Description

Similar to #1818, the names of the spectral models should probably also be revised to have a more coherent naming scheme. This was done already for PowerLaw2 that now becomes PowerLawPhotonFlux. Here an initial proposal, to be discussed of course:

- Constant instead of ConstantValue
- PowerLaw remains
- PowerLawPhotonFlux instead of PowerLaw2
- PowerLawEnergyFlux remains
- BrokenPowerLaw remains
- ExponentialCutoffPowerLaw instead of ExpCutoff
- ExponentialInverseCutoffPowerLaw instead of ExpCutoff2
- SuperExponentialCutoffPowerLaw instead of PLSuperExpCutoff
- Gaussian remains
- LogParabola remains
- FileFunction remains
- NodeFunction remains

Of course, old names should be supported for legacy.

History

#1 - 07/20/2016 04:28 PM - Mayer Michael

LogParabola could also be a "CurvedPowerLaw" (which we use in HESS). It might be more meaningful but I have no strong opinion on that.

#2 - 07/22/2016 08:38 AM - Knödlseeder Jürgen

user#77 wrote:

LogParabola could also be a "CurvedPowerLaw" (which we use in HESS). It might be more meaningful but I have no strong opinion on that.

I think that a curved power law is something different (there is no log-term in the exponent, see https://en.wikipedia.org/wiki/Power_law#Curved_power_law).

Log parabola is a well defined term, and also used for example in XSPEC (see <https://heasarc.gsfc.nasa.gov/xanadu/xspec/manual/XSmodelLogpar.html>).

Which formula are you using in H.E.S.S.?

#3 - 07/22/2016 09:54 AM - Knödseder Jürgen

Jean Ballet has proposed in an e-mail exchange to have the same name for example for all PowerLaw or exponential cutoff models, and to make the distinction at the parameter level. I had thought also about this idea, but so far was hesitant because of the implementation issues (we so far have a registry per name type).

One could maybe rearrange the classes with having a "master" class for a model in general, and then classes for each implementation of those. I think we want to keep a class for each implementation to be able to construct a model in Python (or C++). Maybe a logical can be added to the spectral registry that analyses the model parameters to dispatch to the correct spectral class? This is worth some thinking.

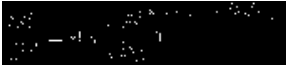
#4 - 07/22/2016 10:03 AM - Mayer Michael

- File *CurvedPowerLaw.png* added

I think that a curved power law is something different (there is no log-term in the exponent, see https://en.wikipedia.org/wiki/Power_law#Curved_power_law).

Interesting. I wasn't aware there is a definition on wikipedia. In HESS, we use the attached formula for the "CurvedPowerLaw" model. This is almost the same as in the Fermi ST or in gammalib, however, yet with a another definition of the signs smile.png

HESS CurvedPowerLaw:



#5 - 07/22/2016 11:10 PM - Knödseder Jürgen

user#3 wrote:

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Extending on that: one possibility could be that the spectral model registry is extended to include in addition to the model type also the model parameters. In that way the XML parser can allocate the appropriate class using the type and the parameters.

#6 - 07/22/2016 11:35 PM - Knödseder Jürgen

So the new list of model names could be:

Type	Classes
Constant	GModelSpectralConst
PowerLaw	GModelSpectralPlaw, GModelSpectralPlaw2
BrokenPowerLaw	GModelSpectralBrokenPlaw
ExponentialCutoffPowerLaw	GModelSpectralExpPlaw, GModelSpectralExpInvPlaw
SuperExponentialCutoffPowerLaw	GModelSpectralSuperExpPlaw
Gaussian	GModelSpectralGauss
LogParabola	GModelSpectralLogParabola
FileFunction	GModelSpectralFunc
NodeFunction	GModelSpectralNodes

#7 - 07/23/2016 08:59 AM - Knödseder Jürgen

- Assigned To set to Knödseder Jürgen
- Target version set to 1.1.0

#8 - 07/24/2016 11:13 PM - Knödseder Jürgen

- Status changed from New to Closed
- % Done changed from 0 to 100

The revised model names have been implemented, merged into devel

Files

CurvedPowerLaw.png	1.01 KB	07/22/2016	Mayer Michael
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