

GammaLib - Bug #1142

Pull distribution of CTA RadialAcceptance model shows offset in Normalization

02/09/2014 10:52 PM - Knödlseider Jürgen

Status:	Closed	Start date:	02/09/2014
Priority:	High	Due date:	
Assigned To:	Knödlseider Jürgen	% Done:	100%
Category:		Estimated time:	0.00 hour
Target version:	00-09-00		
Description			
Everything is in the title. Plots will be posted later.			

History

#1 - 02/10/2014 02:57 PM - Knödlseider Jürgen

- Status changed from New to In Progress
- % Done changed from 0 to 80

It appears that the integration precision of 1e-5 in GObserve::npred_spec was not enough for the highly erratic background model file function. Increasing the precision to 1e-6 is not perfect, but results in a pull distribution that is much more close to a Gaussian.

Here as example the Npred dependence on the integration precision. Using a dumb numerical integration, a value of 1017061.8 is expected:

Precision	Npred	Absolute difference	Relative difference
1e-5	1016370.3	-691.5	-0.07%
1e-6	1017138.6	76.8	+0.008%
1e-7	1017059.2	-2.6	-0.0003%
1e-8	1017062.1	0.3	0.00003%

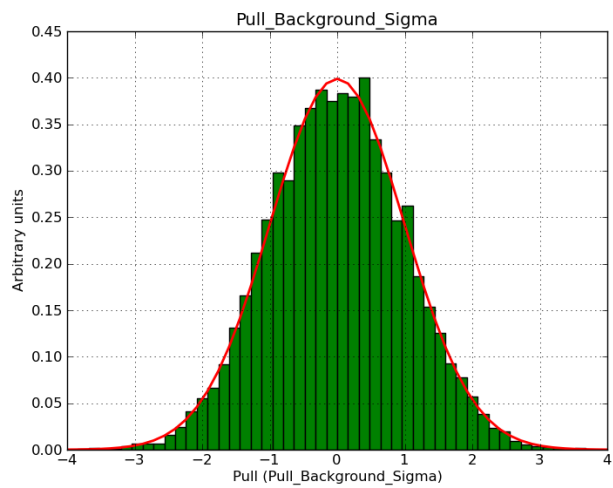
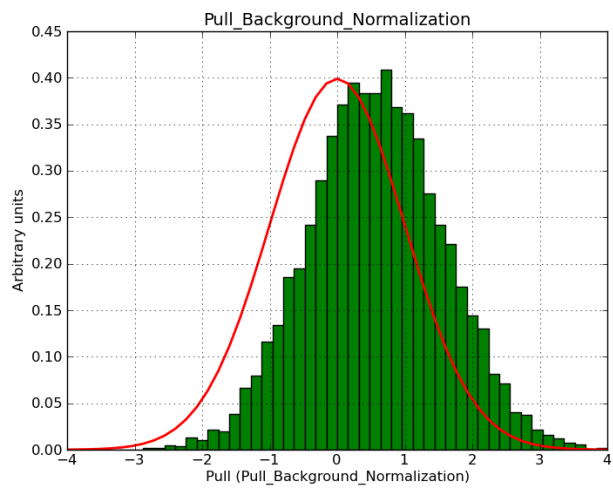
So even with 1e-5 the relative difference is small, but when a long run and the background model is concerned, such a value may be perceptible.

#2 - 02/10/2014 03:15 PM - Knödlseider Jürgen

- File background_normalization_problem.png added
- File background_sigma_problem.png added
- File model_bgd.xml added

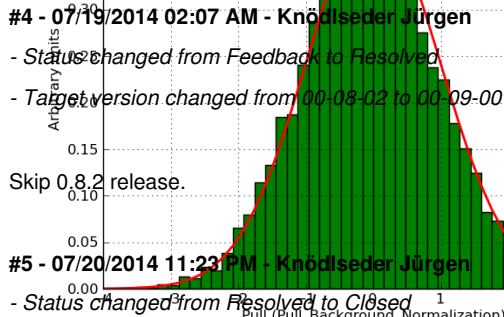
Below the pull distributions for gammalib-00-08-01. The background normalization is obviously systematically shifted towards too high values. The XML file for this simulation can be found here: attachment:model_bgd.xml. The deadtime correction factor has been set to 1 to make sure that the problem is not related to the deadtime correction.

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- File background_normalization_solved.png added
- File background_sigma_solved.png added
- Status changed from In Progress to Feedback
- % Done changed from 80 to 100

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background_normalization_problem.png	47.9 KB	02/10/2014	Knödlseider Jürgen
background_sigma_problem.png	46.4 KB	02/10/2014	Knödlseider Jürgen
model_bgd.xml	510 Bytes	02/10/2014	Knödlseider Jürgen
background_normalization_solved.png	47.8 KB	02/12/2014	Knödlseider Jürgen
background_sigma_solved.png	46.5 KB	02/12/2014	Knödlseider Jürgen