GammaLib - Feature #3924

Add generalized Gaussian spatial model

12/08/2021 11:38 AM - Tibaldo Luigi
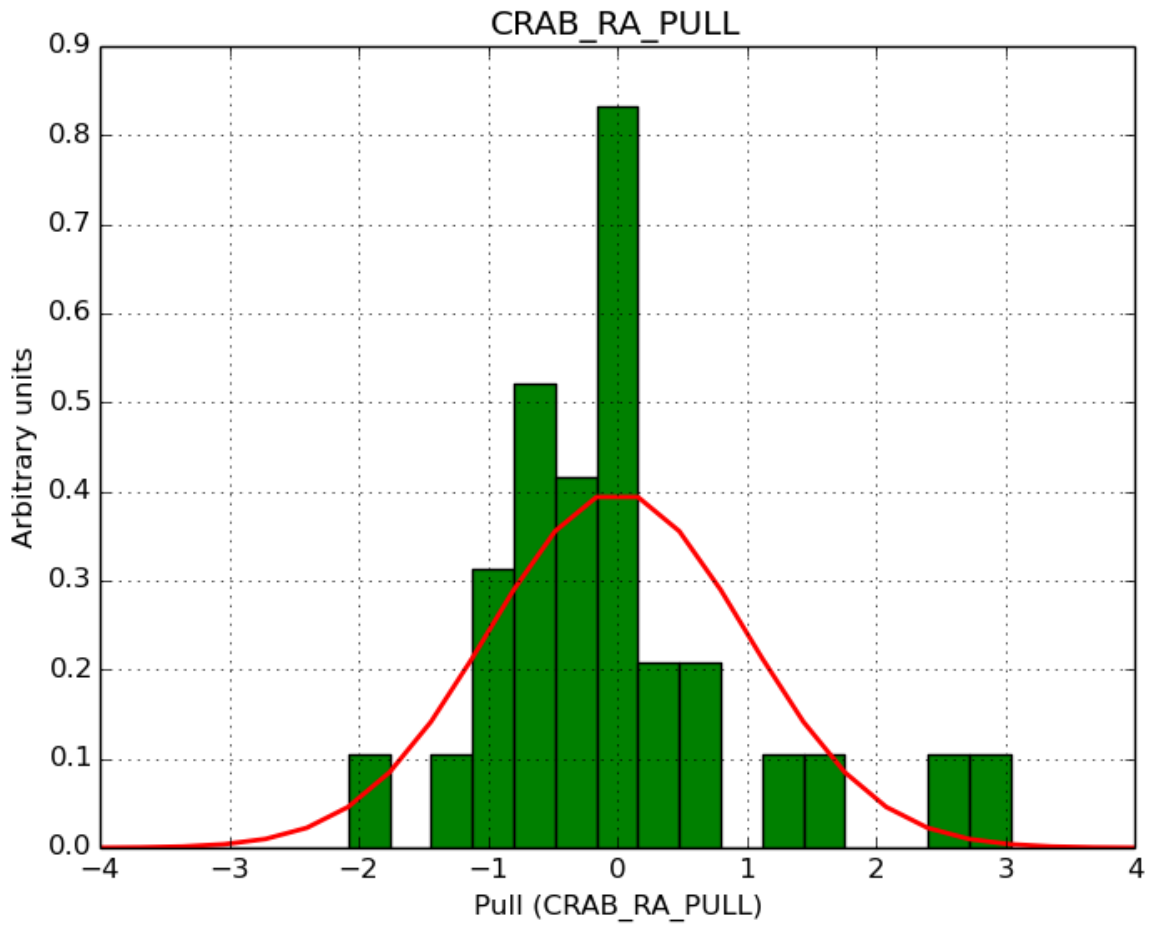
Status:	Closed		**Start date:**	12/08/2021
Priority:	Normal		**Due date:**	
Assigned To:	Tibaldo Luigi		**% Done:**	100%
Category:			**Estimated time:**	0.00 hour
Target version:	2.0.0			

Description

A generalized Gaussian spatial model as described at
https://docs.gammapy.org/dev/modeling/gallery/spatial/plot_gen_gauss.html#sphx-glr-modeling-gallery-spatial-plot-gen-gauss-py
was used in some CTA studies.
For cross-work I need to implement it in GammaLib.
The implementation should follow the GammaLib conventions, i.e., separate the purely radial and elliptical case, and use the minor semi-axis as parameter rather than ellipticity.
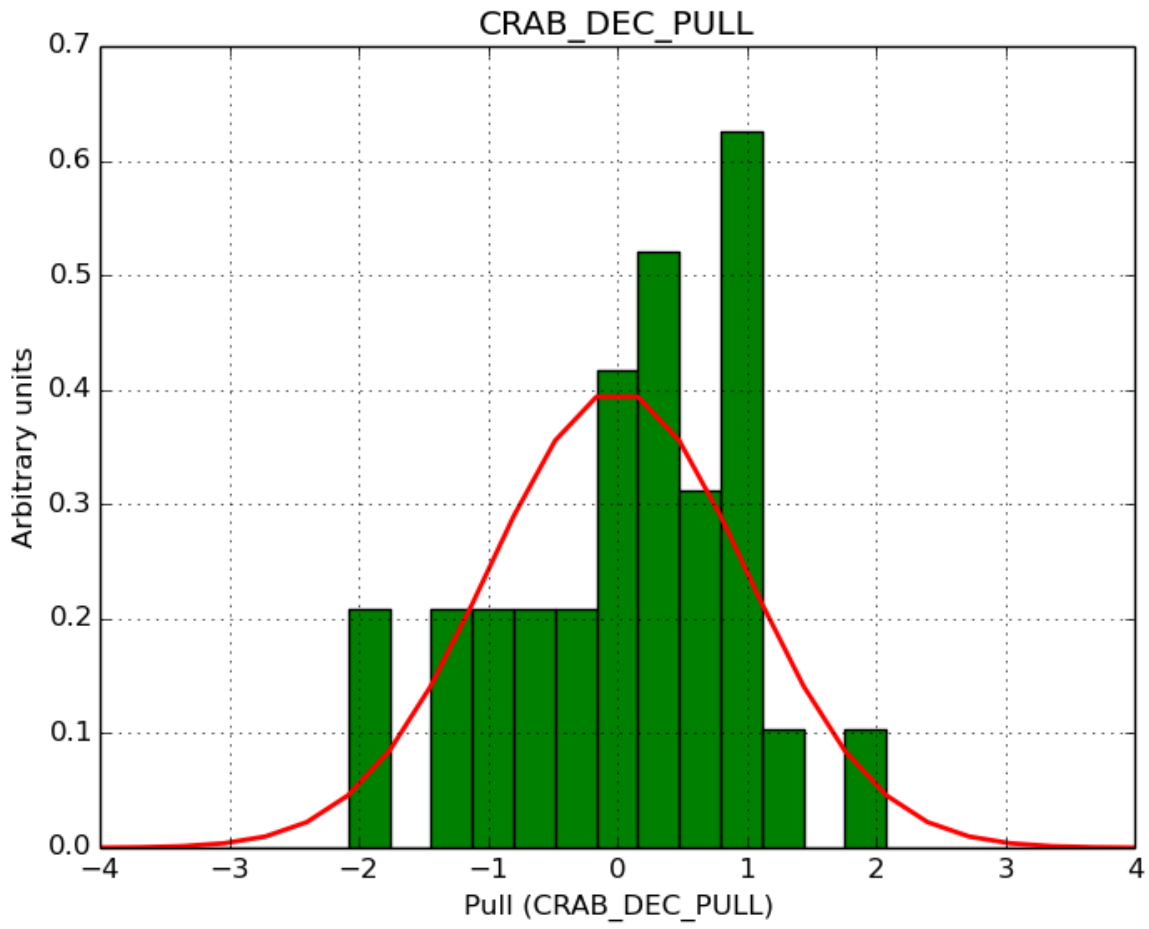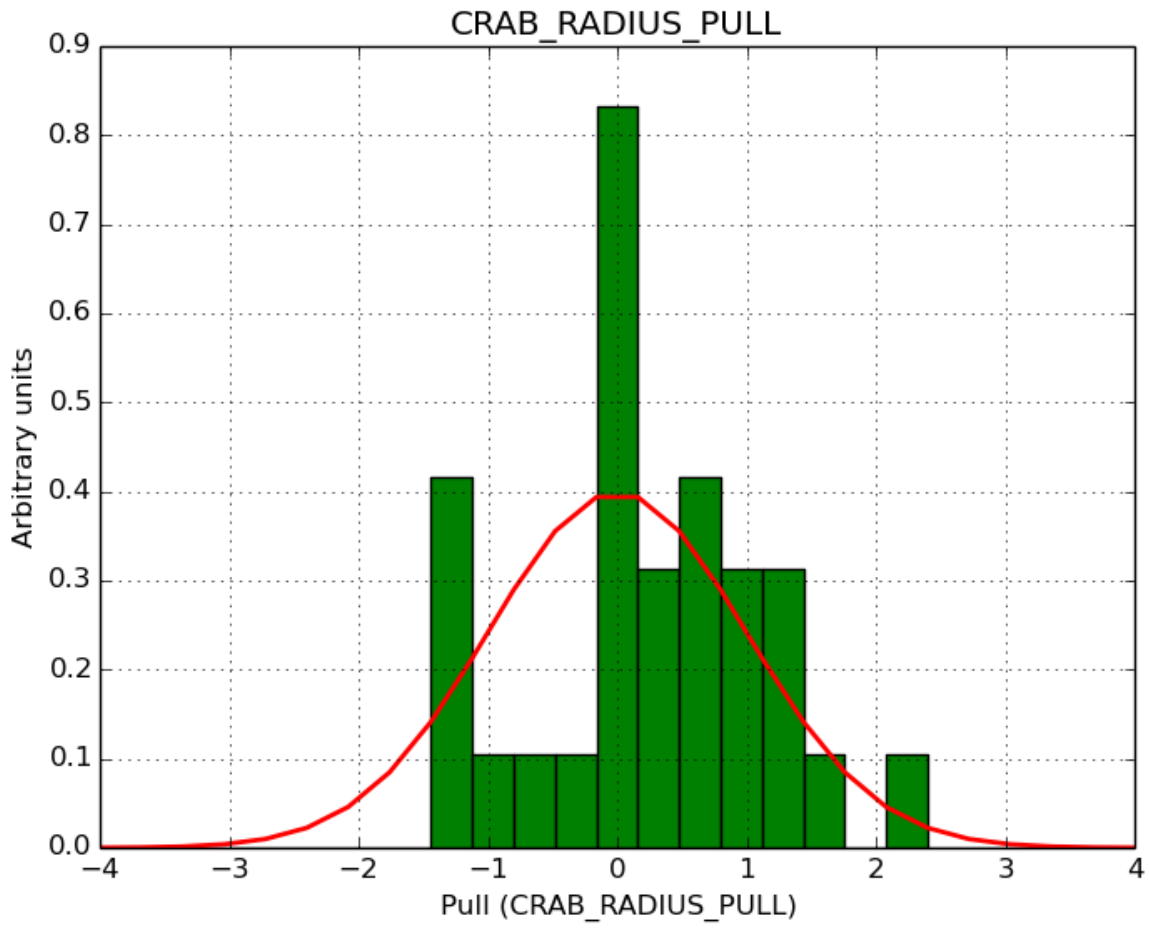
History
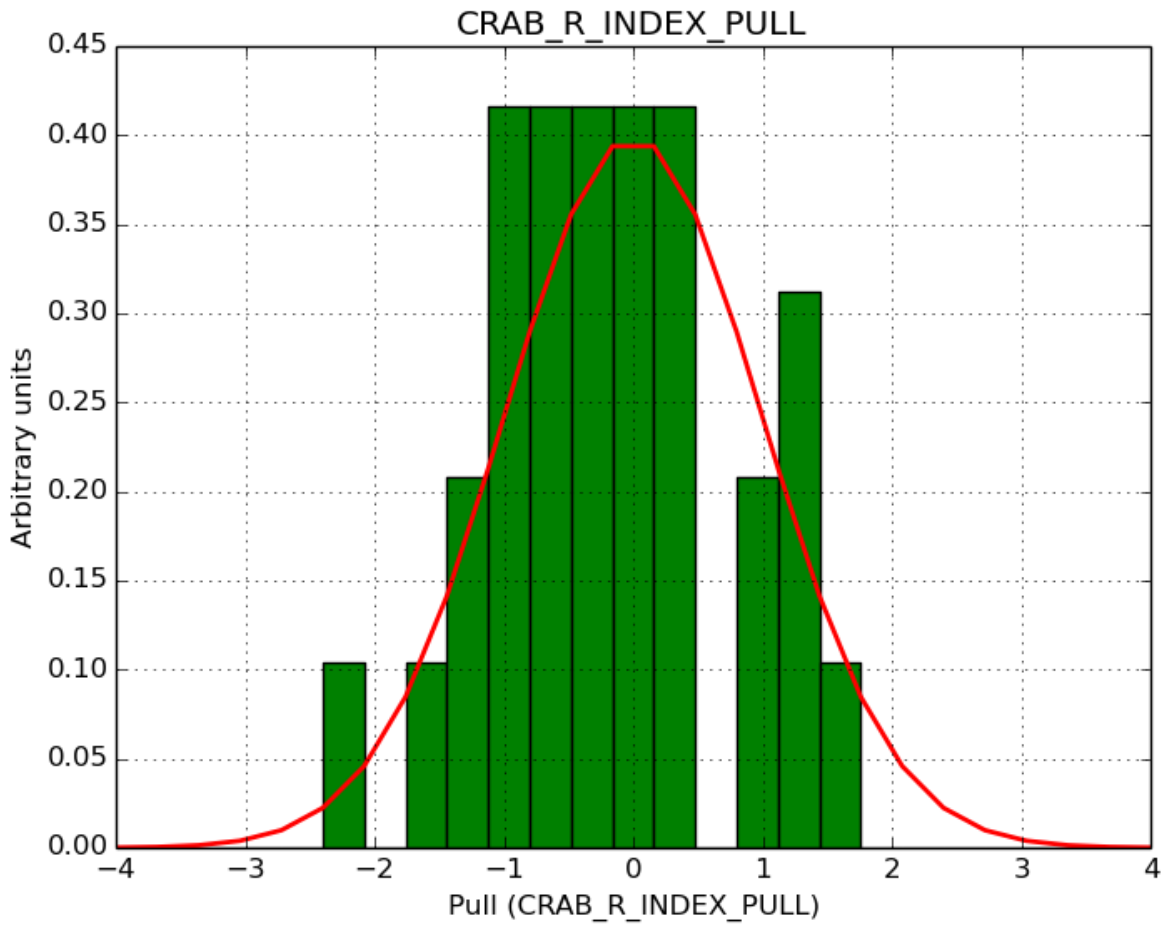
#1 - 12/15/2021 06:12 PM - Tibaldo Luigi

- File bkg_pref.png added

- File dec.png added

- File index.png added

- File prefactor.png added

- File ra.png added

- File radius.png added

- File ridx.png added

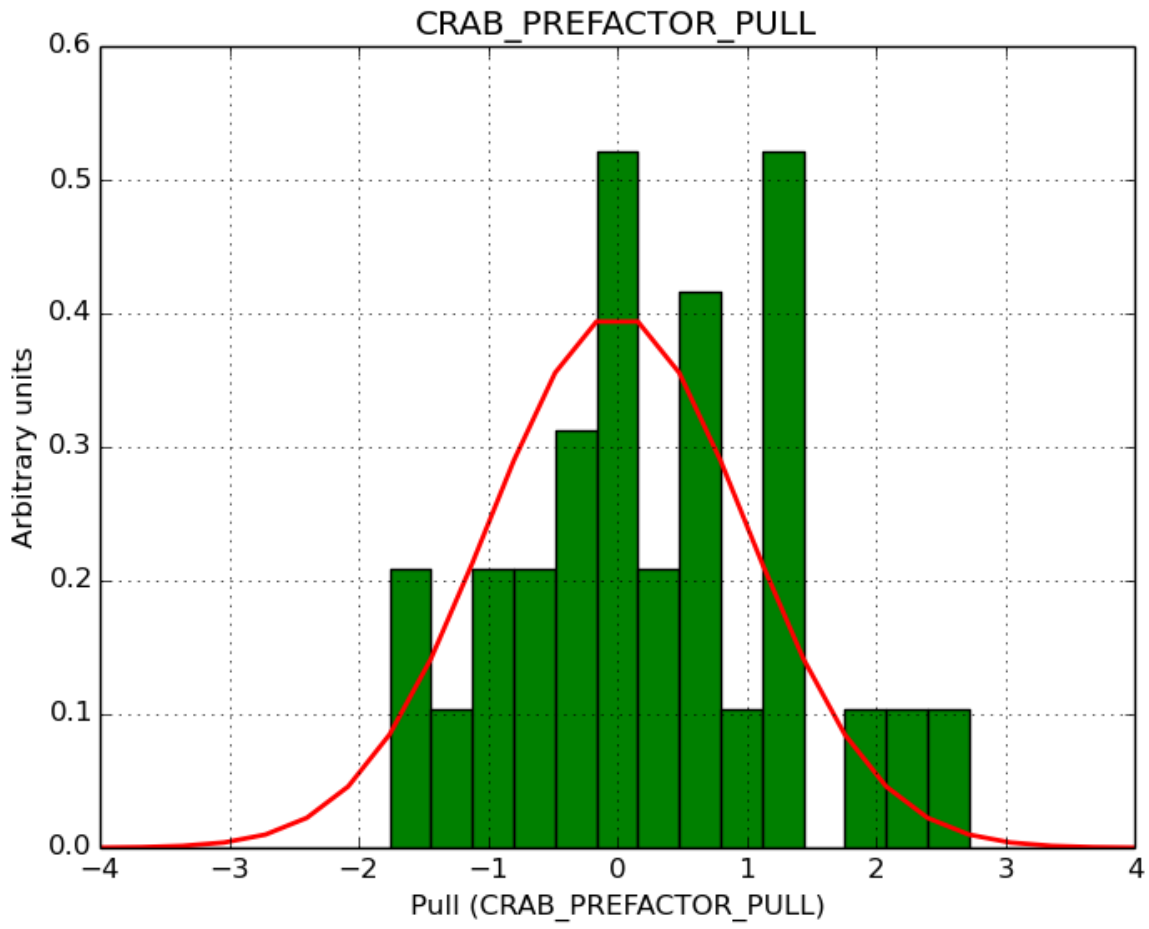*- % Done changed from 0 to 40*

Implemented radial model.
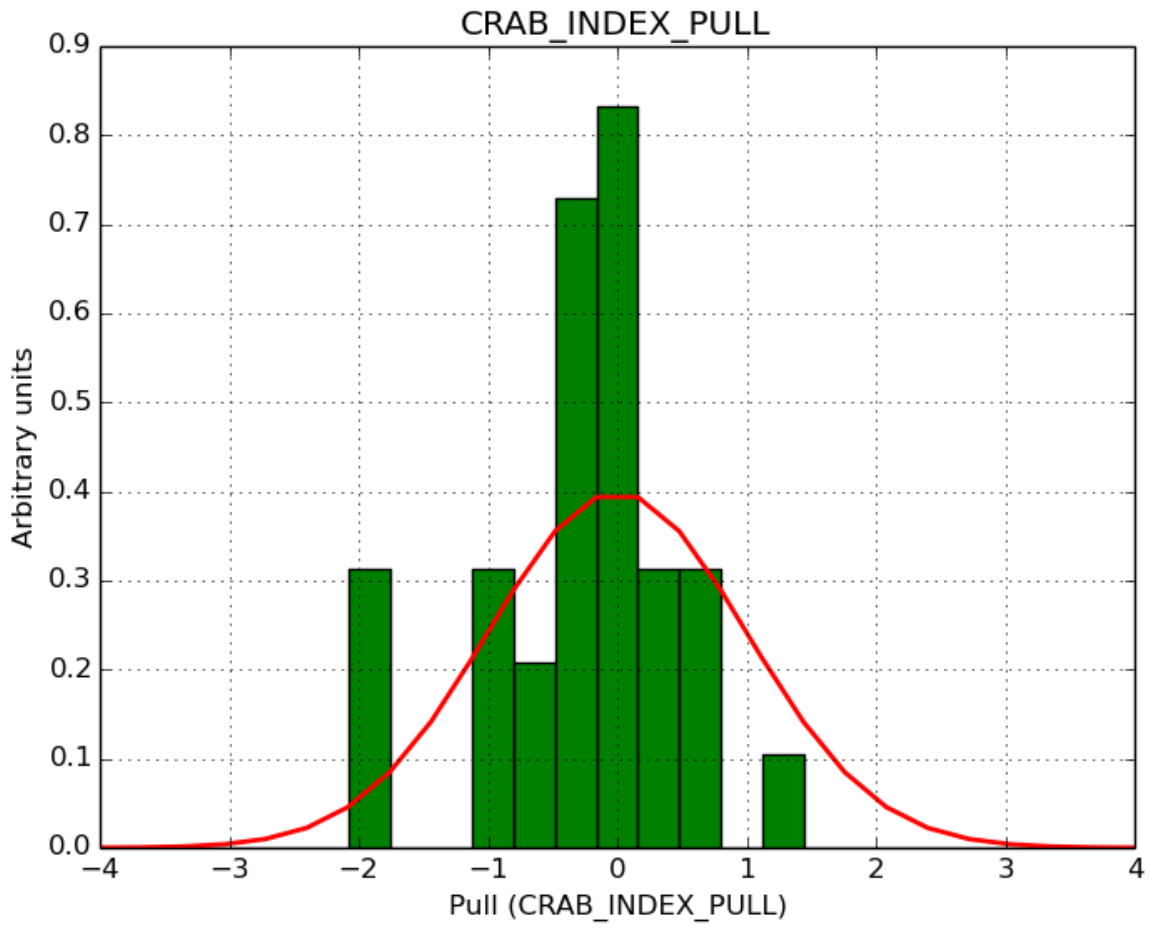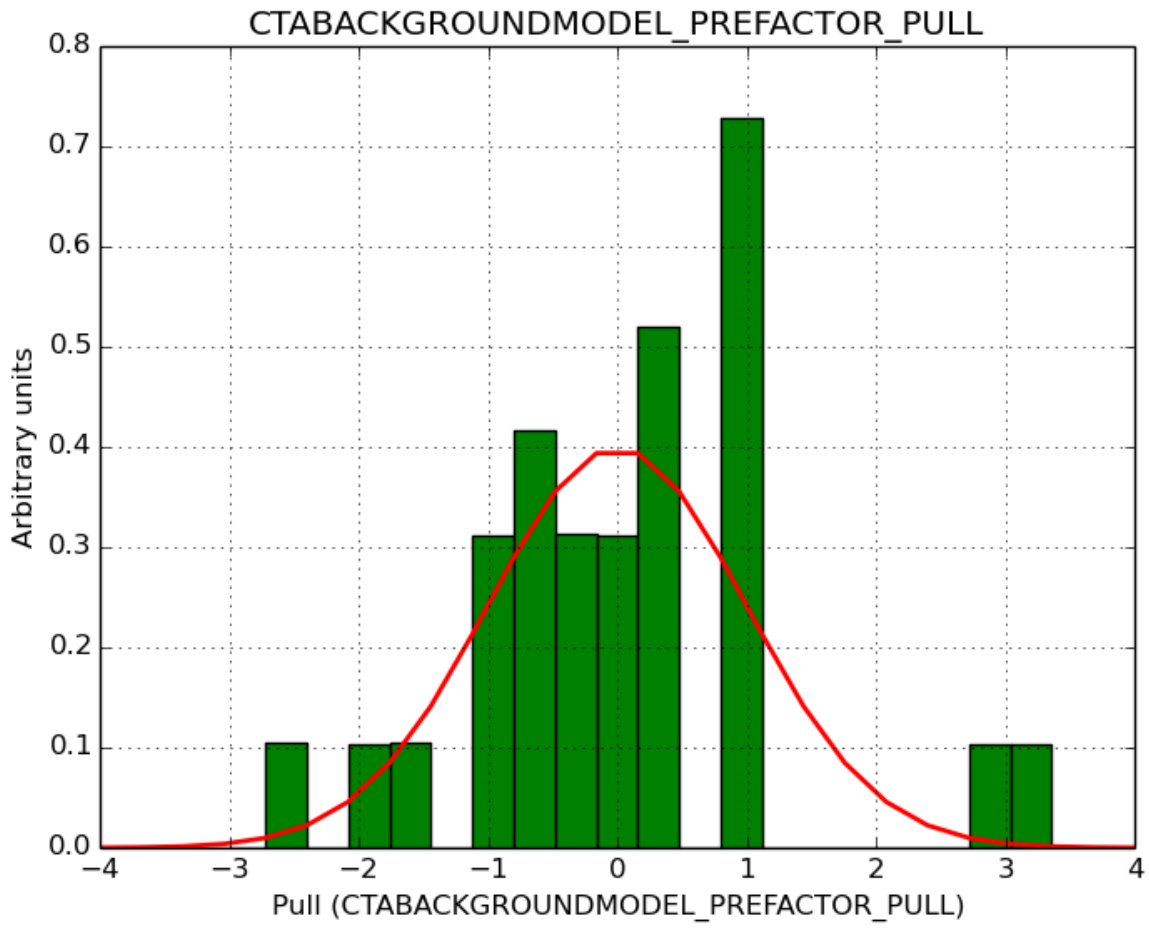I run a quick check making a set of pull distributions. Everything seems to work correctly.

CRAB_RA_PULL

CRAB_DEC_PULL

CRAB_RADIUS_PULL

CRAB_R_INDEX_PULL

CRAB_PREFACTOR_PULL

CRAB_INDEX_PULL

CTABACKGROUNDMODEL_PREFACTOR_PULL

#2 - 01/10/2022 11:51 AM - Tibaldo Luigi

- File ell_bkgprefactor.png added

- File ell_dec.png added

- File ell_index.png added

- File ell_major.png added

- File ell_minor.png added

- File ell_pa.png added

- File ell_prefactor.png added

- File ell_ra.png added

- File ell_ridx.png added

- Status changed from New to In Progress

- % Done changed from 40 to 80

I also implemented the elliptical generalised gaussian, and run a simple test by creating a pull distribution.
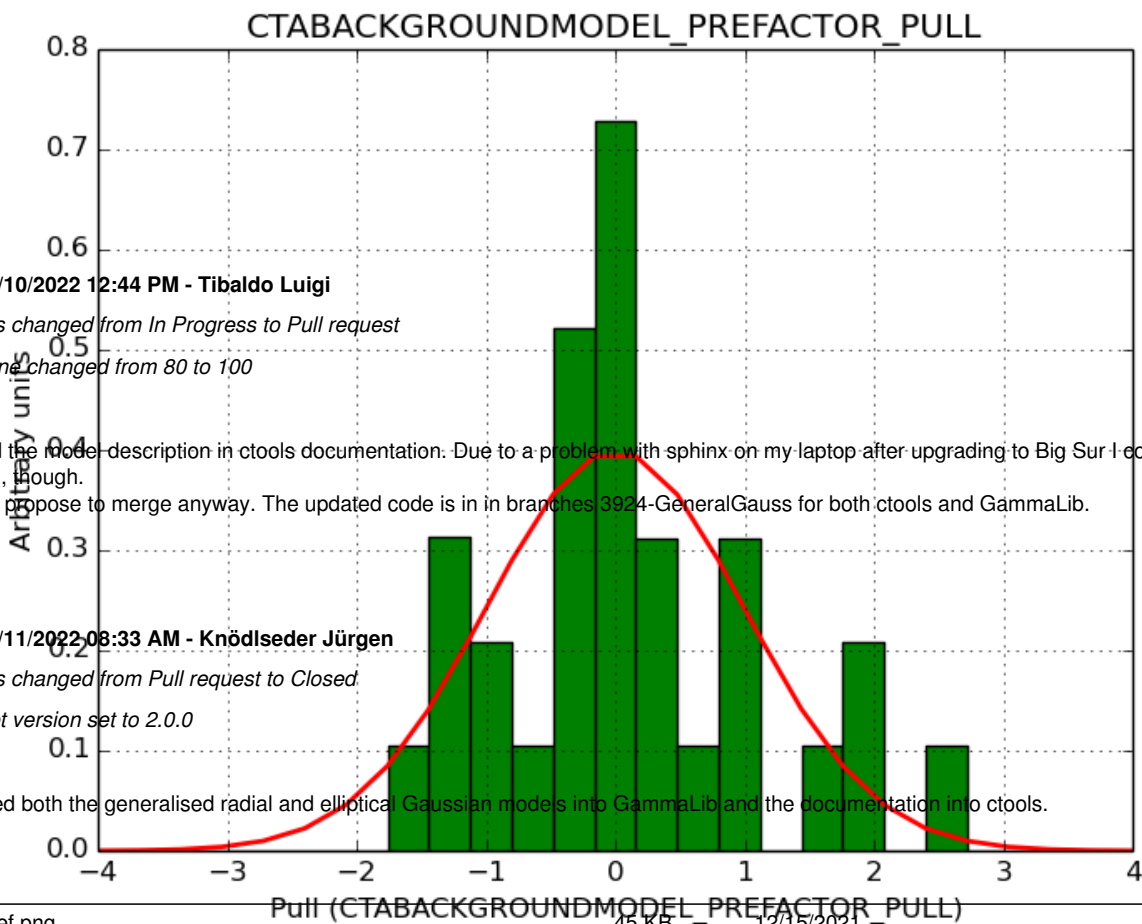

#3 - 01/10/2022 12:44 PM - Tibaldo Luigi

- Status changed from In Progress to Pull request

- % Done changed from 80 to 100

I added the model description in ctools documentation. Due to a problem with sphinx on my laptop after upgrading to Big Sur I could not build the user manual, though.
I would propose to merge anyway. The updated code is in in branches 3924-GeneralGauss for both ctools and GammaLib.

#4 - 01/11/2022 08:33 AM - Knödlseder Jürgen

- Status changed from Pull request to Closed

- Target version set to 2.0.0

I merged both the generalised radial and elliptical Gaussian models into GammaLib and the documentation into ctools.

Files

bkg_pref.png	45 KB	12/15/2021	Tibaldo Luigi
index.png	38.2 KB	12/15/2021	Tibaldo Luigi
prefactor.png	39.3 KB	12/15/2021	Tibaldo Luigi
ra.png	37.5 KB	12/15/2021	Tibaldo Luigi
radius.png	38.9 KB	12/15/2021	Tibaldo Luigi
ridx.png	44.8 KB	12/15/2021	Tibaldo Luigi
dec.png	37.1 KB	12/15/2021	Tibaldo Luigi

ell_dec.png	37.1 KB	01/10/2022	Tibaldo Luigi
ell_index.png	38 KB	01/10/2022	Tibaldo Luigi
ell_major.png	41 KB	01/10/2022	Tibaldo Luigi
ell_minor.png	40.4 KB	01/10/2022	Tibaldo Luigi
ell_pa.png	36.7 KB	01/10/2022	Tibaldo Luigi
ell_prefactor.png	39.5 KB	01/10/2022	Tibaldo Luigi
ell_ra.png	37 KB	01/10/2022	Tibaldo Luigi
ell_ridx.png	38.4 KB	01/10/2022	Tibaldo Luigi
ell_bkgprefactor.png	45 KB	01/10/2022	Tibaldo Luigi