

GammaLib - Feature #1085

GCTAAeff-classes should have members specifying their valid range

01/14/2014 02:04 PM - Mayer Michael

Status:	New	Start date:	01/14/2014
Priority:	High	Due date:	
Assigned To:		% Done:	0%
Category:		Estimated time:	0.00 hour
Target version:			

Description

When we analyse several runs which have been selected differently, the stacking of these runs is not done correctly.

A short example explains the problem better:

Assuming we have two observations with two different IRFs: observation1 valid above 500GeV, observation2 valid above 1TeV (e.g. due to different zenith angles). When cutting away all events below the respective energy thresholds (which was determined by the user), the likelihood fitter thinks, e.g. that in observation2 no event has been detected below 1TeV. Still, the effective area of observation2 could have valid entries below 1TeV. Analysing a present source in both runs will result in an underestimation of the flux between 500GeV and 1TeV, since the fitter thinks that no event has been detected, despite effective area was present.

To circumvent this issue, we could add functions and members for the parameter range to the GCTAAeff-classes. When a value outside of these ranges is requested, the operator() should return zero.

History

#1 - 01/16/2014 03:31 PM - Knödlseher Jürgen

Normally, when you cut events using ctselect, the cut is reflected the by energy boundaries of the observation which are used internally for analysis. Hence there should be not need for a restriction in the response function.

Have you found a case where the energy boundaries per observation are not handled correctly?

#2 - 01/21/2014 09:35 AM - Mayer Michael

Well indeed, my problem occurred, however, during a very specific case: I was trying to calculate spectral points using preselected observations. Each observation in the GObservations container was preselected according to the respective energy threshold. However, when applying ctselect again, to select only events within a certain, small energy range. The GEbounds get in each observation get overwritten and the preselected energy threshold do not apply anymore.

I was able to solve this issue by removing observations with a higher energy threshold from low energy spectral points. I guess this issue can be closed since it is strongly related to issue [#1039](#)