

GammaLib - Change request #2461

Improve accuracy of response computation for stacked analysis

04/26/2018 09:13 AM - Knödlseider Jürgen

Status:	New	Start date:	04/26/2018
Priority:	High	Due date:	
Assigned To:		% Done:	0%
Category:		Estimated time:	0.00 hour
Target version:			
Description			
<p>The response computation in GCTAResponseCube for a stacked analysis is making a number of assumption, for example that the exposure and energy dispersion do not vary significantly over the size of the point spread function. These assumptions may be violated in some cases. It should be carefully checked how accurate the response computation actually is, and if inaccuracies occur, the precision of the response computation should be improved.</p> <p>Here a list of the assumptions:</p> <ul style="list-style-type: none">• GCTAResponseCube::irf_radial: exposure does not vary significantly over PSF• GCTAResponseCube::irf_radial: energy dispersion does not vary significantly over PSF• GCTAResponseCube::irf_radial: compute PSF at observed instead of true values• GCTAResponseCube::irf_elliptical: exposure does not vary significantly over PSF• GCTAResponseCube::irf_elliptical: energy dispersion does not vary significantly over PSF• GCTAResponseCube::irf_elliptical: compute PSF at observed instead of true values• GCTACubeSourceDiffuse::set: exposure does not vary significantly over PSF and energy dispersion• GCTACubeSourceDiffuse::set: compute PSF at observed instead of true values• GCTAResponseCube::irf_diffuse: energy dispersion does not vary significantly over PSF			

History

#1 - 11/07/2018 02:19 PM - Knödlseider Jürgen

Here a list of the assumptions that are made:

- GCTAResponseCube::irf_radial: observed event direction used to evaluate the exposure, the PSF and the energy dispersion.
- GCTAResponseCube::irf_elliptical: observed event direction used to evaluate the exposure, the PSF and the energy dispersion.
- GCTAResponseCube::irf_diffuse: observed event direction used to evaluate the energy dispersion.
- GCTACubeSourceDiffuse::set: observed event direction and energy used to evaluate the exposure and the PSF.

For a point source the computations are correct.

The diffuse source caching should not be needed anymore since the caching is now done at the GCTAResponse::irf level (see #2715). Accordingly the caching should be removed. I created issue #2722 for that.