

GammaLib - Feature #944

Implement `load()`, `eval()` and `eval_gradients()` functions `GModelSpatialDiffuseCube`

09/05/2013 10:35 AM - Mayer Michael

Status:	Closed	Start date:	09/05/2013
Priority:	High	Due date:	
Assigned To:	Mayer Michael	% Done:	100%
Category:		Estimated time:	4.00 hours
Target version:	00-08-00		
Description			
Currently it is not possible to load a spatial cube into memory and work with it. For Fermi analyses the workaround, using the <code>srcmaps</code> (produced by the ScienceTools) is applied. In order to provide e.g. a background cube describing the acceptance of the CTA (or H.E.S.S.) FoV the <code>GModelSpatialDiffuseCube</code> should support the above-mentioned functions.			

History

#1 - 09/05/2013 11:31 AM - Mayer Michael

I would propose to add a protected member `std::vector<double> m_energies` to `GModelSpatialDiffuseCube` since `GSkymap` can contain the different maps but does not store the energy value of each map.

The `load(std::string filename)` function should load the Skymaps from the primary HDU of the file (implemented in `GSkymap`) and look for the second HDU named "ENERGIES" and store the energy values. This would allow to use files like e.g. the Fermi Galactic diffuse model.

#2 - 09/05/2013 01:10 PM - Mayer Michael

I realised that a better method than using a vector of doubles describing the energies, we could use a `GNodeArray`, which allows to interpolate the cube content in energy. Does that sound like a better approach?

#3 - 09/05/2013 01:12 PM - Mayer Michael

Alternatively, one could use `GEBounds` to find the correct energy bin.

#4 - 09/05/2013 04:30 PM - Mayer Michael

- Status changed from New to Pull request

- % Done changed from 0 to 100

- Estimated time changed from 5.00 to 4.00

#5 - 09/07/2013 12:13 PM - Knödseder Jürgen

I was about to pull in your change, but a test failed because there is no test FITS file (before, this was probably ignored). Do you have a small test map cube (small to not overload the `gammalib tarball`)?

#6 - 09/08/2013 11:46 AM - Mayer Michael

- File `test_cube.fits` added

Here is a small (66kb) fits cube. One could probably further reduce the file size by using floats instead of double precision. Then we also would have to adapt the reader I think. The content of the cube is just a gaussian, where the width is changing with energy. The Gaussian is centered on the Crab.

#7 - 09/09/2013 07:36 AM - Mayer Michael

I left two 'to do' points in the `load()` function, since I think we need to create new exceptions, if e.g. the dimension of the loaded fits-image is less than 3.

#8 - 09/09/2013 01:56 PM - Knödseder Jürgen

- Status changed from *Pull request* to *Closed*

Checked in integration, pulled into devel after minor corrections.

#9 - 09/09/2013 01:57 PM - Knödseder Jürgen

Michael Mayer wrote:

I left two 'to do' points in the *load()* function, since I think we need to create new exceptions, if e.g. the dimension of the loaded fits-image is less than 3.

That's okay. In fact, the plan is to remove all the various exceptions and just work with a bunch of standard exceptions in the future.

Files

test_cube.fits	64.7 KB	09/08/2013	Mayer Michael
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