

GammaLib - Change request #1515

Invalid FITS unit string in background cube example file

07/22/2015 12:13 PM - Deil Christoph

Status:	New	Start date:	07/22/2015
Priority:	Normal	Due date:	
Assigned To:		% Done:	0%
Category:		Estimated time:	0.00 hour
Target version:			
Description			
While working on the generation of HESS cube background models, Manuel Paz Arribas came across this issue:			
<pre>>>> from astropy.table import Table >>> table = Table.read('https://github.com/gammalib/gammalib/raw/devel/inst/cta/test/data/bg_test.fits') Downloading https://github.com/gammalib/gammalib/raw/devel/inst/cta/test/data/bg_test.fits ===== ==== 37k/ 37k (100.00%) 0s WARNING: UnitsWarning: '1/s/TeV/sr' did not parse as fits unit: Syntax error parsing unit '1/s/TeV/sr' [astropy.units.core]</pre>			
From the FITS standard it's not 100% clear if this unit string is invalid, but it's at least discouraged: https://github.com/astropy/astropy/issues/3986			
I briefly looked through the Gammalib code and couldn't find the place where FITS units are parsed or written for background cubes. Maybe fixed units are assumed? So I'm not sure if this is actually an issue to be addressed by Gammalib code changes, or just by updating the FITS example file, or if you don't care about this at all, I just thought I'd mention it here.			
Michael Mayer will fix the FITS unit string written in the PA HESS exporters and then we'll remove this temp workaround: https://github.com/gammapy/gammapy/blob/4bc684d4c9dd33151849511d2b35d3e65f356d05/gammapy/background/models.py#L108			

History

#1 - 07/22/2015 01:55 PM - Deil Christoph

I checked ... Gammalib currently doesn't use the unit specified in the FITS header at all:

<http://nbviewer.ipython.org/github/gammapy/gammapy-extra/blob/master/checks/gammalib-background-cube-units-check.ipynb>

Jürgen, is unit handling / conversion something you want to support at the FITS I/O level for such files as background cubes?

#2 - 07/22/2015 08:44 PM - Deil Christoph

Just to follow up on this: the current unit 1/s/TeV/sr is valid under the OGIP unit standard.

But not under the FITS unit standard.

See <https://github.com/astropy/astropy/issues/3986#issuecomment-123820456>

So I guess we have one more thing that needs to be discussed / decided / specified for CTA?

#3 - 07/22/2015 09:01 PM - Knödseder Jürgen

I must admit that I was not aware that there exists a standard for this (I looked once for that but could not find any; I should have looked better).
Anyways, I fully agree to use a FITS standard for this.

You are right that GammaLib does so far not analyze the units, basically because I did not know about the standards.

So we should make sure that actual software that writes FITS files (in your case probably the FITS exporters) write the correct units. At some point we should also interpret these units then in GammaLib.