GammaLib - Bug #3553

Read and writing a FITS table with scaled integer values modifies the integer values

02/25/2021 09:05 AM - Knödlseder Jürgen

Status:	Closed		Start date:	02/25/2021
Priority:	Normal		Due date:	
Assigned To:	Knödlseder Jürgen		% Done:	100%
Category:			Estimated time:	0.00 hour
Target version:	2.0.0			
Description				

When reading and writing a FITS tables with scaled integer values the integer values are scaled in the written dataset. The integer values should be written without any scaling.

History

#1 - 02/25/2021 09:10 AM - Knödlseder Jürgen

The following code

```
>>> import gammalib
>>> f=gammalib.GFits('/project-data/comptel/data/phase01/vp0001_0/m16992_evp.fits')
>>> f.saveto('m16992_evp.fits', True)
```

results in the following table content:

File	X_D1	Y_D1	L_D1
Original	346.625	472.65625	0.0546875
Saved	10.8215	14.75	0

#2 - 02/25/2021 11:40 AM - Knödlseder Jürgen

- *File evp-original.png added*

- *File evp-saved.png added*

- *Status changed from New to Pull request*

- *% Done changed from 0 to 90*

I added a m_tscale to GFitsTableCol that will hold the value of the optional TSCALn keyword, if no keyword is found the value will be 1.

The member will be set in GFitsTable::data_open() using the new GFitsTableCol::tscale() method that was added for this purpose.

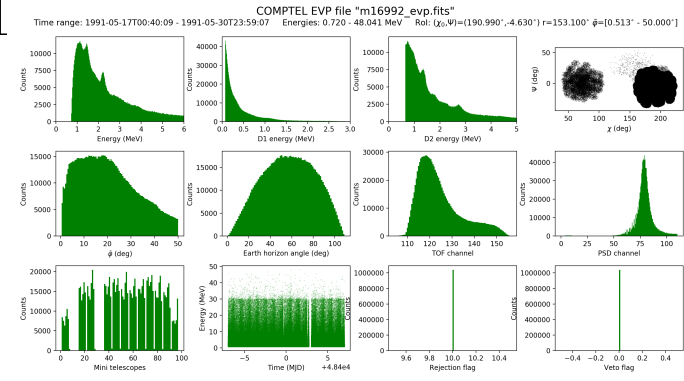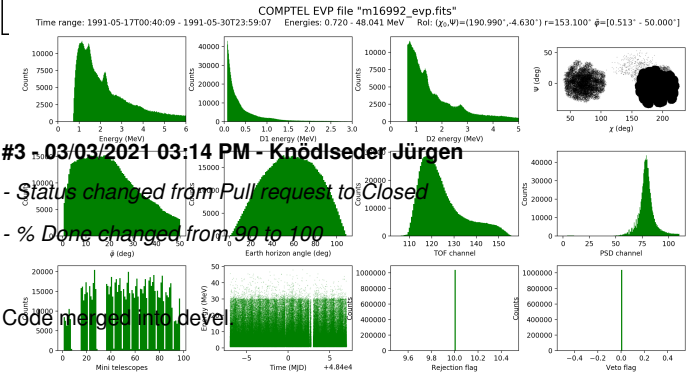Before loading a FITS column in GFitsTableCol::load_column() the internal FITS scaling will be disabled in case that m_tscale != 1. This assures that no information is lost in reading the FITS file, and when the FITS file is saved the same information that was found in the input file is written. Note that the TSCALn keywords are not affected by this operation, hence the same information exists in the saved FITS file.

If scaling of a FITS column is needed the scaling needs to be performed manually.

To validate the code, I checked the events in the original and saved COMPTEL EVP using show_evp.py. Both plots look identical.

Original file	Save file

COMPTEL EVP file "m16992_evp.fits"
Time range: 1991-05-17T00:40:09 - 1991-05-30T23:59:07   Energies: 0.720 - 48.041 MeV   Rol: (χ₀,Ψ)=(190.990°,-4.630°) r=153.100° φ̄=[0.513° - 50.000°]

#3 - 03/03/2021 03:14 PM - Knödlseder Jürgen

- *Status changed from Pull request to Closed*

- *% Done changed from 90 to 100*

Code merged into devel.

Files

evp-original.png	531 KB	02/25/2021		Knödlseder Jürgen
evp-saved.png	531 KB	02/25/2021		Knödlseder Jürgen