ctools - Bug #2140

ctmodel does not work for cube-background (reason: 'instrument' value)

06/29/2017 06:08 PM - Eschbach Stefan

Status:	Closed		**Start date:**	06/29/2017
Priority:	High		**Due date:**	
Assigned To:	Knödlseder Jürgen		**% Done:**	100%
Category:			**Estimated time:**	0.00 hour
Target version:	1.3.1			

Description

After running a simulation (with ctobssim) and creating a background cube, I wanted to create a model cube of the simulated background.
For this I used the .xml-file that I got from ctbkgcube, see 'outmodel_0.xml' (sources were deleted manually).
The model cube was always empty! For sources, ctmodel worked fine, the problem only occurred with cube-background.

After a few days of investigation I now discovered that the reason is the 'instrument' value.
If I change it manually to 'CTA,HESS,MAGIC,VERITAS', everything works fine, see 'outmodel.xml'.

I don't know how to fix the problem in the ctools-code, wether one should change what ctbkgcube writes in the xml-files or better change what ctmodel accepts as instrument value, so I assign this to Jürgen, I hope this is okay. I also attached the cubes if you want to reproduce the problem.
Thanks!

History

#1 - 06/30/2017 02:49 PM - Eschbach Stefan

- File deleted (exp_cube.fits)

#2 - 06/30/2017 02:49 PM - Eschbach Stefan

- File deleted (bkg_cube.fits)

#3 - 06/30/2017 02:49 PM - Eschbach Stefan

- File deleted (psf_cube.fits)

#4 - 06/30/2017 02:50 PM - Eschbach Stefan

I had to delete the cubes because I was told they were HESS intern, sry...

#5 - 06/30/2017 03:16 PM - Knödlseder Jürgen

- Priority changed from Normal to High

- Target version set to 1.3.1

I recently remove the CTA,HESS,MAGIC,VERITAS instruments from the XML file, but apparently this has a side effect. I'll try to fix the code that it works without that string.

#6 - 07/11/2017 05:14 PM - Knödlseder Jürgen

- Status changed from New to In Progress

It appears that ctmodel needs either an instrument of CTA or no instrument attribute to work correctly.

This happens probably because ctmodel creates an observation with the instrument set to CTA in ctmodel::get_obs.

The issue comes in fact from a change in ctbkgcube::run where before the tool wrote always the attribute "CTA,HESS,MAGIC,VERITAS" into the XML file while now it collects the instruments for all input observations in the instrument attribute using the following code:

```
        // Collect instrument identifiers
        if (instruments.length() > 0) {
            instruments += ",";
        }
        instruments += m_bkgmdl[i]->instruments();
```

This by the way explains why your XML file has many times the HESS attribute since for each HESS input background model one string will be appended. This logic should be changed so that each instrument string is unique.

Now the issue still is that ctmodel does not know that a HESS observation is handled. ctmodel should probably extract the instrument from the counts cube TELESCOPE keyword.

#7 - 07/11/2017 05:27 PM - Knödlseder Jürgen

- Target version changed from 1.3.1 to 1.4.0

I manually changed the TELESCOP keyword in an event list to HESS and ctbin then created a counts cube with the TELESCOP keyword set to HESS. So it appears that the issue is that ctobssim does create an event list with the TELESCOP keyword set to CTA.

So far ctobssim always creates a CTA observation. In principle, the instrument type can be inferred from the response function FITS file TELESCOP keywords, and the code should in fact check that the instrument for an observation and the response function is consistent. This needs to add an instrument attribute to the IRFs, which implies an interface change, hence I move the issue to version 1.4.0.

#8 - 07/11/2017 05:47 PM - Knödlseder Jürgen

- Target version changed from 1.4.0 to 1.3.1

- % Done changed from 0 to 80

I decided to put back the setting of the CTA,HESS,MAGIC,VERITAS attribute in ctbkgcube, and do this in the bugfix release 1.3.1.

I created issue #2152 to request a proper taking into account of non-CTA instruments.

#9 - 07/24/2017 02:00 PM - Knödlseder Jürgen

- Status changed from In Progress to Closed

- % Done changed from 80 to 100

Files

outmodel.xml	527 Bytes	06/29/2017		Eschbach Stefan
outmodel_0.xml	574 Bytes	06/29/2017		Eschbach Stefan