ctools - Bug #1308

ctlike crashes when several background models are given

08/01/2014 08:47 AM - Lu Chia-Chun

Status:	Closed	**Start date:**	08/01/2014
Priority:	Urgent	**Due date:**	
Assigned To:	Knödlseder Jürgen	**% Done:**	100%
Category:		**Estimated time:**	0.00 hour
Target version:	00-08-00		

Description

ctlike crashes when several backgrounds in model.xml are linked to their corresponding observations of the same id.

No error messages except 'Segmentation fault (core dumped)'

History

#1 - 08/01/2014 10:07 AM - Knödlseder Jürgen

This is probably something we never tested.

I think I understand what happens, but I cannot really verify unless you can provide me with some test data.

I think the problem is related to parallel processing. It should disappear when you switch off OpenMP support (./configure --disable-openmp).

GammaLib loads map cubes only when it really needs them. When you use OpenMP, GammaLib creates multiple copies of the model, and at that point, multiple threads are trying to access at the same time the same file, which leads to the cfitsio problem. The error code (108) is
READ_ERROR   108   error reading from FITS file
(see http://heasarc.gsfc.nasa.gov/docs/software/fitsio/quick/node26.html).

Can you trying switching off OpenMP support to see whether the problem disappears?

#2 - 08/01/2014 10:50 AM - Lu Chia-Chun

- Status changed from New to Feedback

Switch off openMp does resolve the problem!

#3 - 08/01/2014 11:03 AM - Knödlseder Jürgen

- Status changed from Feedback to In Progress

- % Done changed from 0 to 10

Good. Now I have to think about how to prevent this problem.

It is in fact annoying that GammaLib creates multiple copies of the model just for OpenMP. This creates multiple copies of the model in memory, which can be quite exhaustive. I don't fully understand why the problem occurs in fact, as each thread (which corresponds to one observation) should only use it's specific model.

I still would like to have a test case to better understand the problem. We need a fix for that.

#4 - 10/25/2014 11:53 AM - Knödlseder Jürgen

- Status changed from In Progress to Feedback

- Target version set to 00-08-00

- % Done changed from 10 to 90

I added to GModelSpatialDiffuseCube::fetch_cube an OpenMP protection:

```
if (!m_loaded && !m_filename.empty()) {
    #pragma omp critical
    {
        const_cast<GModelSpatialDiffuseCube*>(this)->load(m_filename);
    }
}
```

Hope that this solves the issue.

#5 - 10/31/2014 11:16 PM - Knödlseder Jürgen

Chia-Chun, did you have a chance to check whether this is fixed now?

#6 - 11/03/2014 04:41 PM - Lu Chia-Chun

No. ctselect crashes without error messages after I updated. I am not sure what the problem is. I am still testing.

#7 - 11/04/2014 10:05 AM - Lu Chia-Chun

Hi Juergen,

I believe now it works. Thank you for the effort to resolve this problem!

#8 - 11/07/2014 10:18 PM - Knödlseder Jürgen

- Status changed from Feedback to Closed

- % Done changed from 90 to 100