ctools - Support #1675

time consuming of diffuse simulation

02/17/2016 09:44 AM - Yang Lili

Status:	Closed		**Start date:**	02/17/2016
Priority:	Normal		**Due date:**	
Assigned To:	Knödlseder Jürgen		**% Done:**	50%
Category:			**Estimated time:**	0.00 hour
Target version:	1.1.0			

Description

We apply ctobssim to do the simulation of diffuse emission with GALPROP mapcubes, which takes very long, e.g. about 13 days for a 100h simulation on grid computers. We believe that this time scales with the dimension of the mapcube, i.e. the time it takes is probably mostly due to I/O and interpolations of the maps. Is this correct? For our case, the size of the mapcube is

NAXIS1 =   785 / length of data axis 1
NAXIS2 =   392 / length of data axis 2
NAXIS3 =   31 / length of data axis 3

Aside from making coarser mapcubes, do you have any advise as of how we could shorten the ctools simulation time?

Thanks for your help.

History

#1 - 02/17/2016 11:03 AM - Knödlseder Jürgen

- Status changed from New to In Progress

- Assigned To set to Knödlseder Jürgen

- % Done changed from 0 to 50

I have started to investigate this (see #1673) and I can reproduce your problem. Although the map cube is big, this is not really the problem. The problem is that your simulations go to low energy (20 GeV) where the effective area is small, and ctobssim has not been very efficient in handling that (it always uses a simulation area for the Monte Carlo that is larger than the effective area at any energy). As a consequence, ctobssim simulates many low-energy photons that it then throws away, and this is very time consuming.

I modified ctobssim so that it takes into account the energy dependence of the effective area. Now, the simulations of photons is considerably more efficient at low energies, leading to only a modest number of photons that are thrown away. This should speed up things dramatically. You can test the latest code from the devel branch. I still need to do some science verification, but for the moment things look good.

#2 - 02/22/2016 10:14 PM - Knödlseder Jürgen

- Status changed from In Progress to Closed

- Target version set to 1.1.0

Problem is now solved (see #1673).