GammaLib - Bug #1988

CTA event simulation for energy range with zero effective area throws an exception

04/05/2017 10:54 AM - Knödlseder Jürgen

Status:	Closed		**Start date:**	04/05/2017
Priority:	High		**Due date:**	
Assigned To:	Eschbach Stefan		**% Done:**	100%
Category:			**Estimated time:**	0.00 hour
Target version:	1.3.0			

Description

If CTA events are simulated for an energy range where the effective area is zero the GModelSpectralNodes::append() method throws an exception.

The reason is that the code in GCTAModelAeffBackground::mc

```
    GModelSpectralNodes spectral;
    for (int i = 0; i < spectral_ebounds.size(); ++i) {
        GEnergy energy   = spectral_ebounds.elogmean(i);
        double intensity = aeff_integral(obs, energy.log10TeV());
        double  norm     = m_spectral->eval(energy, events->tstart());
        spectral.append(energy, norm * intensity);
    }
```

does not check whether the product norm * intensity is positive, which leads to the exception. A test should be added that appends only positive nodes.

The side effect is that the GModelSpectralNodes object may be empty, which later poses a problem in GModelSpectralNodes::flux that returns an exception if there are no nodes. Instead, the method should simply return zero.

History

#1 - 04/06/2017 12:15 PM - Eschbach Stefan

- Status changed from New to Pull request

- % Done changed from 0 to 50

I implemented a statement to check if "norm*intensity>0" and only appends if this is true.
The missing aeff-entry leads to getting stuck in a do-loop later in the code, because the variable "value" will be zero then.
I fixed this by adding another statement that breaks the loop if there were 100 trys and value still stays zero.

I'm not a 100% sure if this leads to further problems in specific cases, in my case it seems to work now.

Changes are implemented in seschbach/gammalib 1988-Change-Effective-Area

#2 - 04/09/2017 12:18 AM - Knödlseder Jürgen

- Status changed from Pull request to Closed

- Assigned To set to Eschbach Stefan

- % Done changed from 50 to 100

Code merged into devel.