GammaLib - Action #1249

Create GCTAExposure class

07/08/2014 03:27 PM - Knödlseder Jürgen

Status:	Closed		**Start date:**	07/08/2014
Priority:	Normal		**Due date:**	
Assigned To:	Lu Chia-Chun		**% Done:**	100%
Category:			**Estimated time:**	0.00 hour
Target version:	3rd coding sprint			

Description

The GCTAExposure class should implement a CTA exposure cube, which is a 3D cube spanned by Right Ascension or Galactic longitude, Declination or Galactic latitude and log10 energy. The class may use the GSkymap class as storage container for the exposure cube information. The exposure cube values are effective area times lifetime, summed over a list of provided CTA observations. The typical interface should look like this:

```
  // Constructors and destructors
  GCTAExposure(void);
  GCTAExposure(const GCTAExposure& exposure);
  GCTAExposure(const GObservations& obs, const GSkymap& map);
  virtual ~GCTAExposure(void);

  // Operators
  GCTAExposure& operator=(const GCTAExposure& exposure);

  // Methods
  void        clear(void);
  GCTAExposure* clone(void) const;
  void        load(const std::string& filename);
  void        save(const std::string& filename);
  std::string   print(const GChatter& chatter = NORMAL) const;

protected:
  // Methods
  void init_members(void);
  void copy_members(const GCTAExposure& exposure);
  void free_members(void);

  // Data
  GSkymap m_cube; //!< Exposure cube
```

History

#1 - 07/08/2014 03:38 PM - Knödlseder Jürgen

- Assigned To set to Lu Chia-Chun

- Target version set to 3rd coding sprint

#2 - 07/10/2014 11:12 AM - Lu Chia-Chun

- Status changed from New to In Progress

- % Done changed from 0 to 50

The GCTAExposure class has been created.

Todos:
Interpolation
communication with GCTAResponse

#3 - 07/10/2014 02:19 PM - Knödlseder Jürgen

- % Done changed from 50 to 60

I merged the actual version of your GCTAExposure class into trunk after adapting the class interface and making the code compliant with the coding conventions. Exposure is now computed as effective area times livetime.

A set() method exists to set an exposure map from a single GCTAObservation, a fill() method exists to fill exposure from all CTA observations in an observation container. Writing and saving of the exposure cube works, reading and loading is not yet supported.

I also added unit tests to test_CTA.

Still to be done:

- implement read() and load() methods
- implement exposure cube access operator(s)

#4 - 07/11/2014 12:39 PM - Lu Chia-Chun

- Status changed from In Progress to Pull request

- % Done changed from 60 to 70

access operator and interpolation implemented.

To do:
read()
load()

#5 - 07/11/2014 02:27 PM - Knödlseder Jürgen

- Status changed from Pull request to Resolved

- % Done changed from 70 to 100

Added load() and read() access operators and merged into trunk.

#6 - 07/20/2014 11:21 PM - Knödlseder Jürgen

- Status changed from Resolved to Closed

- Remaining (hours) set to 0.0