GammaLib - Action #755

Feature # 754 (Closed): Allow fitting of elliptical morphology shapes

Implement GModelSpatialElliptical base class

02/16/2013 09:22 PM - Knödlseder Jürgen

Status:	Closed	**Start date:**	02/16/2013
Priority:	Normal	**Due date:**	
Assigned To:	Knödlseder Jürgen	**% Done:**	100%
Category:		**Estimated time:**	0.00 hour
Target version:	1.0.0		

Description

The abstract base class of elliptical models should be GModelSpatialElliptical. It derives from the GModelSpatial.

Here is a proposal for the interface of the GModelSpatialElliptical class:

```
class GModelSpatialElliptical : public GModelSpatial {

public:
   // Constructors and destructors
   GModelSpatialElliptical(void);
   GModelSpatialElliptical(const GModelSpatialElliptical& model);
   explicit GModelSpatialElliptical(const GXmlElement& xml);
   virtual ~GModelSpatialElliptical(void);

   // Operators
   virtual GModelSpatialElliptical& operator=(const GModelSpatialElliptical& model);

   // Pure virtual methods
   virtual void                clear(void) = 0;
   virtual GModelSpatialElliptical* clone(void) const = 0;
   virtual std::string         type(void) const = 0;
   virtual double              eval(const double& theta, const double& posangle) const = 0;
   virtual double              eval_gradients(const double& theta, const double& posangle) const = 0;
   virtual GSkyDir             mc(GRan& ran) const = 0;
   virtual double              theta_max(void) const = 0;
   virtual std::string         print(void) const = 0;

   // Implemented virtual base class methods
   virtual double    eval(const GSkyDir& srcDir) const;
   virtual double    eval_gradients(const GSkyDir& srcDir) const;
   virtual void      read(const GXmlElement& xml);
   virtual void      write(GXmlElement& xml) const;

   // Other methods
   double          ra(void) const { return m_ra.real_value(); }
   double          dec(void) const { return m_dec.real_value(); }
   double          posangle(void) const { return m_posangle.real_value(); }
   GSkyDir         dir(void) const;
   void            dir(const GSkyDir& dir);
   void            posangle(const double& posangle) { m_posangle.real_value(posangle); }

protected:
   // Protected methods
   void init_members(void);
   void copy_members(const GModelSpatialElliptical& model);
   void free_members(void);

   // Proteced members
   GModelPar  m_ra;      //!< Right Ascension (deg)
   GModelPar  m_dec;     //!< Declination (deg)
```

```
    GModelPar  m_posangle; //!< Position angle from North, counterclockwise (deg)
};
```

The base class stores the model centre and the position angle. The position angle is specified in celestial coordinates (Right Ascension, Declination), and is counted counterclockwise from North (usual convention).

There are variants of the eval and eval_gradients method that take an offset angle and a position angle as arguments.

History

#1 - 02/17/2013 09:31 AM - Knödlseder Jürgen

- Target version set to HESS sprint #1

#2 - 02/17/2013 11:00 PM - Mayer Michael

Looks great. Only *posang* sounds a bit odd, may *posangle* or *pos_angle* would be more meaningful?

#3 - 02/17/2013 11:46 PM - Knödlseder Jürgen

- Subject changed from Implement GModelElliptical base class to Implement GModelSpatialElliptical base class

- Description updated

#4 - 02/17/2013 11:46 PM - Knödlseder Jürgen

Michael Mayer wrote:

> Looks great. Only *posang* sounds a bit odd, may *posangle* or *pos_angle* would be more meaningful?

Agree. Changed to posangle.

#5 - 02/17/2013 11:52 PM - Knödlseder Jürgen

- Status changed from New to In Progress

- Assigned To set to Knödlseder Jürgen

Start implementation.

#6 - 02/18/2013 12:23 AM - Knödlseder Jürgen

- File GModelSpatial.jpg added

- Description updated

- Status changed from In Progress to Feedback

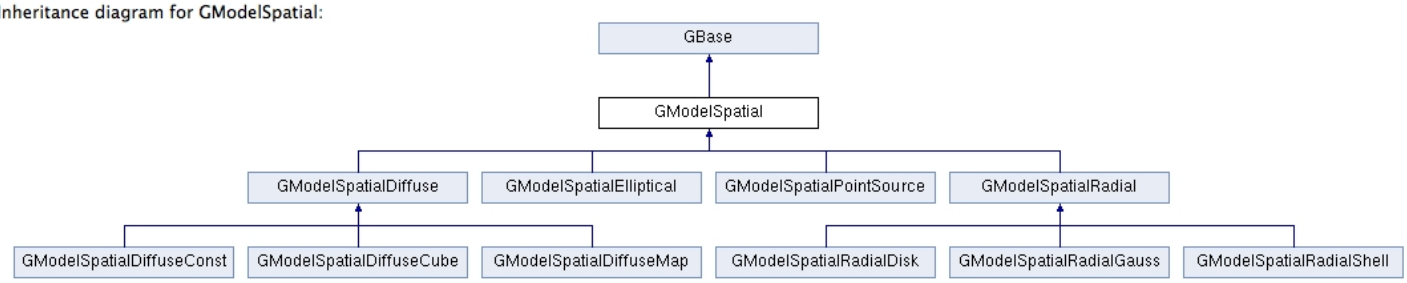
- % Done changed from 0 to 100

- Remaining (hours) set to 0.0

An initial version of GModelSpatialElliptical has been implemented following the lines indicated above.

The new inheritance diagram of GModelSpatial is shown below:

Inheritance diagram for GModelSpatial:



#7 - 05/15/2013 09:27 AM - Knödlseder Jürgen

- Target version changed from HESS sprint #1 to 00-08-00

#8 - 12/03/2013 09:59 AM - Knödlseder Jürgen

- Status changed from Feedback to Closed

- Estimated time set to 0.00

#9 - 12/10/2013 12:19 AM - Knödlseder Jürgen

- Target version deleted (00-08-00)

#10 - 07/11/2014 04:12 PM - Knödlseder Jürgen

- Target version set to 1.0.0

Files

GModelSpatial.jpg	75.8 KB	02/17/2013	Knödlseder Jürgen