

## GammaLib - Feature #3469

### Add GModelAssociation and GModelAssociations classes

11/26/2020 08:57 AM - Knödlseider Jürgen

<b>Status:</b>	Closed	<b>Start date:</b>	11/26/2020
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assigned To:</b>	Knödlseider Jürgen	<b>% Done:</b>	100%
<b>Category:</b>		<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>	2.0.0		
<b>Description</b>			
<p>The GModelAssociation class should store source association information for a given model. The method shall read and write the source information from or into an XML file. A possible XML format is:</p>			
<pre>&lt;source name="Source_001" type="PointSource"&gt;   &lt;spectrum type="PowerLaw"&gt;     ...   &lt;/spectrum&gt;   &lt;spatialModel type="PointSource"&gt;     ....   &lt;/spatialModel&gt;   &lt;associations&gt;     &lt;association name="Crab"&gt;       &lt;property name="RA" value="83.6331"/&gt;       &lt;property name="DEC" value="22.0145"/&gt;       &lt;property name="distance" value="0.0123"/&gt;       &lt;property name="probability" value="0.978"/&gt;     &lt;/association&gt;   &lt;/associations&gt; &lt;/source&gt;</pre>			
<p>Instances of GModelAssociation are gathered in a GModelAssociations container class that organises the reading and writing of the information. As for models, association names in a container shall be unique.</p>			

### History

#### #3 - 11/28/2020 12:12 AM - Knödlseider Jürgen

- Status changed from New to Pull request
- Assigned To set to Knödlseider Jürgen
- % Done changed from 0 to 90

I implemented the GModelAssociation and GModelAssociations classes and added an instance of GModelAssociations as a member to the GModel class.

I added GModel::associations() getter and setter methods to access the associations. The associations are also automatically written in the GModel::read\_attributes() and GModel::write\_attributes() methods, and the association names are displayed by GModel::print\_attributes().

Below is the content of the test/data/crab\_associations.xml file to illustrate the XML format of the associations.

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<source_library title="source library">
  <source name="1FGL J0005.7+3815" type="PointSource" instrument="LAT,CTA" id="000001" ts="100.100" tscal="1">
    <spectrum type="PowerLaw">
      <parameter name="Prefactor" value="1.73" error="0" scale="1e-07" min="1e-07" max="1000" free="1" />
      <parameter name="Index" value="-2.1" error="0" scale="1" min="-5" max="5" free="1" />
      <parameter name="PivotEnergy" value="100" scale="1" min="10" max="1000000" free="0" />
    </spectrum>
    <spatialModel type="PointSource">
      <parameter name="RA" value="83.6331" scale="1" min="-360" max="360" free="0" />
    </spatialModel>
  </source>
</source_library>
```

```
<parameter name="DEC" value="22.0145" scale="1" min="-90" max="90" free="0" />
</spatialModel>
<scaling>
  <instrument name="LAT" value="1.1" scale="1" min="0.1" max="10" free="0" />
  <instrument name="CTA" value="0.5" scale="1" min="0.1" max="10" free="0" />
</scaling>
<associations>
  <association name="Crab nebula">
    <property name="RA" value="83.6331" />
    <property name="DEC" value="22.0145" />
  </association>
  <association name="Crab pulsar">
    <property name="RA" value="83.6331" />
    <property name="DEC" value="22.0145" />
  </association>
</associations>
</source>
</source_library>
```

#### **#4 - 11/28/2020 12:58 PM - Knödlseider Jürgen**

- *Status changed from Pull request to Closed*

- *% Done changed from 90 to 100*

Merged into devel.