Error information in ctools/gammalib

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Confidence regions/ covariance matrix information

- analysis: fitting of a model \rightarrow ctlike ۲

 - model-xml file \leftarrow error information
 - no direct access to covariance matrix
 - no access to error ellipses/conf. regions
 - \rightarrow no handle on correlation of parameters and related uncertainties

This is important information which should be provided

What to provide, how to provide?

- covariance matrix, e.g. fits file, structured information (flag)
- likelihood profiles \rightarrow which parameters? output format? ۲
 - \rightarrow very much related to cterror I think...



Integral flux/eflux & error handling

GModelSpectral.hpp

virtual methods	
void	<pre>clear(void) = 0;</pre>
GModelSpectral*	<pre>clone(void) const = 0;</pre>
std::string	<pre>classname(void) const = 0;</pre>
std::string	<pre>type(void) const = 0;</pre>
double	eval(const GEnergy& srcEng,
	<pre>const GTime& srcTime = GTime()) const = 0;</pre>
double	eval_gradients(const GEnergy& srcEng,
	<pre>const GTime& srcTime = GTime()) = 0;</pre>
double	flux(const GEnergy& emin,
	const GEnergy& emax) const = 0;
double	eflux(const GEnergy& emin,
	<pre>const GEnergy& emax) const = 0;</pre>
GEnergy	<pre>mc(const GEnergy& emin, const GEnergy& emax,</pre>
	const GTime& time, GRan& ran) const = 0;
void	<pre>read(const GXmlElement& xml) = 0;</pre>
void	<pre>write(GXmlElement& xml) const = 0;</pre>
std::string	<pre>print(const GChatter& chatter = NORMAL) const = 0;</pre>
	<pre>virtual methods void GModelSpectral* std::string double double double GEnergy void void std::string</pre>

methods for flux/eflux calculation in the base class
 fitted models: parameter errors need to be taken into account

 \rightarrow no handle on uncertainties for flux/eflux at the moment?



ctbutterfly - confidence bands for spectrum plots

Purpose

 calculate confidence band around best fit model, according to a specified confidence level (e.g. 68%)

Status

- only working for pure power law
 - from covariance matrix calculate error ellipse
 - for discrete energy values 'walk around the ellipse'
 - → take min/max (envelopes)



→ this needs some kind of generalization to get confidence bands for arbitrary spectral models



Conclusion

- lack of the addressed information/ features became obvious during daily work = standard usage
 - → really needed to get a reasonable overview of analysis results
- additional topic (I was asked about that):

is somewhere a detailed documentation available how to built a template map for analysis (format specifications, keywords, normalization...)?