

## GammaLib - Feature #311

### Tune Levenberg-Marquard optimizer

07/13/2012 10:45 PM - Knödseder Jürgen

<b>Status:</b>	Closed	<b>Start date:</b>	07/13/2012
<b>Priority:</b>	High	<b>Due date:</b>	
<b>Assigned To:</b>	Knödseder Jürgen	<b>% Done:</b>	100%
<b>Category:</b>		<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>	1.0.0		
<b>Description</b>			
The actual Levenberg-Marquard optimizer needs still some tuning.			
For example, sometimes the optimizer stalls for many iteration, and finally stops with the same values it had at the beginning of the stall. This is not very CPU efficient. The algorithm has to be studied to better understand where these stalls come from.			
Maybe related to this, the gradients are actually not used in the stopping criterion, but sometimes, gradients become very small, and the algorithm will start to oscillate around the minimum due to numerical fluctuations. This could be prevented by stopping once the gradients are below a certain threshold. Alternatively, one could set small gradients to zero to avoid fluctuations of the algorithm due to these gradients.			
A study should therefore be conducted that leads to a better understanding of the numerical properties of the Levenberg-Marquard optimizer.			
<b>Related issues:</b>			
Related to ctools - Bug # 1074: Optimizer does not converge for parameters cl...		<b>Closed</b>	<b>01/09/2014</b>

#### History

##### #1 - 09/14/2012 11:39 PM - Knödseder Jürgen

- Target version set to 00-07-00

##### #2 - 12/04/2012 11:05 PM - Knödseder Jürgen

- Target version deleted (00-07-00)

##### #3 - 07/11/2014 04:14 PM - Knödseder Jürgen

- Target version set to 1.0.0

##### #4 - 10/31/2014 04:28 PM - Knödseder Jürgen

- Status changed from New to In Progress

- Assigned To set to Knödseder Jürgen

- Priority changed from Normal to High

- % Done changed from 0 to 80

Some progress was done by improving the response computation (effectively helping the convergence) and by allow for a small log-likelihood decrease (see #1074). It needs now to be seen whether problems of convergence still occur or whether this has now been solved.

##### #5 - 06/29/2015 10:01 PM - Knödseder Jürgen

Unless anything new comes up during testing, I'd propose to close that one.

##### #6 - 07/02/2015 06:13 PM - Knödseder Jürgen

- Status changed from In Progress to Closed

- % Done changed from 80 to 100