



AHELP for CIAO 3.4

powell

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Synopsis

The Powell optimization method.

Syntax

```
powell [iters] [eps] [tol] [huge]
```

Description

The POWELL method is a single-shot method which attempts to find the local fit-statistic minimum nearest to the starting point. Its principal advantage is that it is a robust direction-set method. A set of directions (e.g., unit vectors) are defined; the method moves along one direction until a minimum is reached, then from there moves along the next direction until a minimum is reached, and so on, cycling through the whole set of directions until the fit statistic is minimized for a particular iteration. The set of directions is then updated and the algorithm proceeds. Its principal disadvantages are that it will not find the local minimum as quickly as LEVENBERG-MARQUARDT if the statistic surface is well-behaved, and there is no guarantee it will find the global fit-statistic minimum.

The eps parameter controls when the optimization will cease; for POWELL, this will occur when

$$| S_i - S_{(i-1)} | < 0.5 * eps * (|S_i| + |S_{(i-1)}|)$$

where $S_{(i-1)}$ and S_i are the observed statistic values for the $(i-1)$ th and i th iteration, respectively.

Parameters

name	type	def	min	max
iters	integer	2000	1	10000
eps	real	1.e-6	1.e-9	0.001
tol	real	1.e-6	1.e-8	0.1
huge	real	1.e+10	1000	1.e+12

Detailed Parameter Descriptions

Parameter=iters (integer default=2000 min=1 max=10000)

Maximum number of iterations.

Parameter=eps (real default=1.e-6 min=1.e-9 max=0.001)

Criterion to stop fit.

Parameter=tol (real default=1.e-6 min=1.e-8 max=0.1)

Tolerance in lnmnop

Parameter=huge (real default=1.e+10 min=1000 max=1.e+12)

Vestigial.

Bugs

See the [Sherpa bug pages](#) online for an up-to-date listing of known bugs.

See Also

sherpa

[get](#), [method](#), [expr](#), [grid](#), [grid-powell](#), [levenberg-marquardt](#), [method](#), [monte-lm](#), [monte-powell](#), [montecarlo](#), [sigma-rejection](#), [simplex](#), [simul-ann-1](#), [simul-ann-2](#), [simul-pow-1](#), [simul-pow-2](#), [usermethod](#)

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URL:
<http://cxc.harvard.edu/ciao3.4/powell.html>
Last modified: December 2006