

 $URL: \underline{http://cxc.harvard.edu/ciao3.4/powell.html}$

Last modified: December 2006

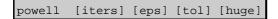
AHELP for CIAO 3.4 Context: sherpa

Jump to: Description Parameters Bugs See Also

Synopsis

The Powell optimization method.

Syntax



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 ith iteration, respectively.

Parameters

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

powell 1

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

The Chandra X-Ray Center (CXC) is operated for NASA by the Smithsonian Astrophysical Observatory.
60 Garden Street, Cambridge, MA 02138 USA.
Smithsonian Institution, Copyright © 1998–2006. All rights reserved.

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