Ahelp: simplex - CIAO 3.4



URL: http://cxc.harvard.edu/ciao3.4/simplex.html
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AHELP for CIAO 3.4

simplex

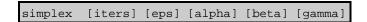
Context: sherpa

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Synopsis

A simplex optimization method.

Syntax

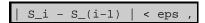


Description

The SIMPLEX 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 can work well with complicated statistic surfaces (more so than LEVENBERG-MARQUARDT), while also working quickly (more so than POWELL). Its principal disadvantages are that it has a tendency to "get stuck" in regions with complicated topology before reaching the local fit-statistic minimum, and that there is no guarantee it will find the global fit-statistic minimum. Its tendency to stick means that the user may be best-served by repeating fits until the best-fit point does not change.

A simplex is geometrical form in N-dimensional in parameter space which has N+1 vertices (e.g., in 3-D it is a tetrahedron). The fit statistic is evaluated for each vertex, and one or more points of the simplex are moved, so that the simplex moves towards the nearest local fit-statistic minimum. When a minimum is reached, the simplex may also contract itself, as an amoeba might; hence, the routine is also sometimes called ``amoeba.'' Convergence is reached when the simplex settles into a minimum and all the vertices are within some value eps of each other.

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



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

simplex 1

alpha	real	1	0.1	2
<u>beta</u>	real	0.5	0.05	1
gamma	real	2	1.1	20

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=alpha (real default=1 min=0.1 max=2)

Algorithm convergence factor.

Parameter=beta (real default=0.5 min=0.05 max=1)

Algorithm convergence factor.

Parameter=gamma (real default=2 min=1.1 max=20)

Algorithm convergence factor.

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, powell, sigma-rejection, simul-ann-1, simul-ann-2, simul-pow-1, simul-pow-2, usermethod

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