Subject: Re: Optimization "AMOEBA"
Posted by Wout De Nolf on Wed, 23 Sep 2009 13:41:48 GMT
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On Wed, 23 Sep 2009 04:49:42 -0700 (PDT), Jeremy Bailin
<astroconst@gmail.com> wrote:

> I seem to remember Craig mentioning that implementing a constraint
> using a brick wall like that can give you problems.

Yes, for non-linear least squares refinement. See CONSTRAINT in code
below.

```
FUNCTION CONSTRAINT,Pin
; P must be with ]P0-dP,P0+dP[
COMMON FUNC_XY, P0, dP
return,P0+2*dP/!pi*atan(Pin)
END

FUNCTION FUNC, Pin, NOCONSTR=NOCONSTR

; NOCONSTR is just for plotting
if keyword_set(NOCONSTR) then P=Pin $
else P=CONSTRAINT(Pin)

z=120.0
N_rows=3.0
d_fov=67
mu=438.689
R_tot=1.5
a_max=30
N=P[1]
R_i=P[0]
;a_max=P[2]

x=N*tan(a_max/2.0*!pi/180.0)*1.1/N_rows/!pi-1.0

a=2.0*asin((1.0/x+1.0)*d_fov/2/z)*180/!pi

 d=sqrt(R_tot^2-x^2*(R_i)^2)/(x+1)-alog(2)/mu*tan(a/2*!pi/180 )

 S=N*(1+x)^2/16/x^2/z^2*(d^2+2/mu*d*tan(a/2*!pi/180)+2/mu^2*( tan(a/2*!pi/180))^2)*100

if ~finite(s) then stop
RETURN, -S
```

```
END

pro test34

COMMON FUNC_XY, P0, dP
P0=[0.3, 60]
dP=[0.5,15]

R=AMOEBA(1.0e-5,SCALE=dP, P0=P0, FUNCTION_VALUE=fval)
if r[0] eq -1 then begin
 print,'No minimum found.'
 return
endif
xmax=CONSTRAINT(r[0:1])
ymax=-fval[0]
PRINT, 'x_Value:', xmax
PRINT, 'maximum:', ymax

; Plot
n=200
L=P0-dP
H=P0+dP
inc1=(2*dP[0])/n
inc2=(2*dP[1])/n
b1=L[0]
b2=L[1]

x=b1+inc1*indgen(n)
y=b2+inc2*indgen(n)
z=fltarr(n,n)
for i=0,n-1 do $
 for j=0,n-1 do $
  z[i,j]=-func([x[i],y[j]],/NOCONSTR)

isurface,z,x,y
end
```