Subject: Amoeba function
Posted by Nicki on Thu, 19 Nov 2009 01:18:51 GMT
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I have the following problem with my amoeba code: It does not do its job ;) (Probably because i didn't write it right). It's supposed to find the minimum. But it only finds a local minimum (I guess) not a global one.

This is the code:

```
FUNCTION CONSTRAINT,Pin
COMMON FUNC_XY, P0, dP
return,P0+2*dP/!pi*atan(Pin)
END
FUNCTION FUNC, Pin, NOCONSTR=NOCONSTR
if keyword_set(NOCONSTR) then P=Pin $
else P=CONSTRAINT(Pin)
nrows=1.       ;number of rows
mu=438.689       ;attenuation coefficient
r_tot=1.5       ;target resolution
r_i=P[3]       ;detector intrinsic resolution
rad=P[0]        ;distance 'centre of source'-pinhole
wdet=P[1]       ;detector width
dfov=P[2]       ;diameter of the field-of-view
a=180/!pi*2*asin(dfov/2/rad)     ;pinhole opening angle
f=wdet/2/(tan(a/2/180*!pi))     ;distance pinhole-detector
N=2.*!pi*(rad+f)/(1.1*wdet)*Nrows     ;number of pinholes/detectors
 d=sqrt(R_tot^2-(rad/f)^2*(R_i)^2)/((rad/f)+1.)-alog(2)/mu*ta n(a/2*!pi/
180)  ;pinhole diameter
 deffs=sqrt(d^2+2/mu*d*tan(a/2*!pi/180)+2/(mu^2)*(tan(a/2/180 *!pi))
^2) ;effective diameter (Sensitivity)
S=N*deffs^2/16/(rad^2)*100     ;Sensitivity
if ~finite(s) then stop
RETURN, -S
END

pro numerical
COMMON FUNC_XY, P0, dP
P0=[60., 80., 80., 0.45]      ;initial starting point
dP=[27., 20., 20., 0.4]       ;scale
R=AMOEBA(1.0e-5,SCALE=dP, P0=P0, FUNCTION_VALUE=fval)   ;result
if r[0] eq -1 then begin
       print,'No minimum found.'
       return
endif
xmax=CONSTRAINT(r)
ymax=-fval[0]
```

END

It gives me a minimum (or in this case actually maximum, but anyway...) for R_i=0.05 and w_det=100. S_max is then 0.0088 or s.th like that. However, if i remove R_i and w_det from the constraint and put them into the input, as R_i=0.05 and w_det=100,

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.............
r_i=0.05       ;detector intrinsic resolution
rad=P[0]       ;distance 'centre of source'-pinhole
wdet=100.      ;detector width
dfov=P[1]      ;diameter of the field-of-view
a=180/!pi*2*asin(dfov/2/rad)     ;pinhole opening angle
f=wdet/2/(tan(a/2/180*!pi))     ;distance pinhole-detector
N=2.*!pi*(rad+f)/(1.1*wdet)*Nrows     ;number of pinholes/detectors
 d=sqrt(R_tot^2-(rad/f)^2*(R_i)^2)/((rad/f)+1.)-alog(2)/mu*ta n(a/2*!pi/
180)  ;pinhole diameter
 deffs=sqrt(d^2+2/mu*d*tan(a/2*!pi/180)+2/(mu^2)*(tan(a/2/180 *!pi))
^2) ;effective diameter (Sensitivity)
S=N*deffs^2/16/(rad^2)*100     ;Sensitivity
if ~finite(s) then stop
RETURN, -S
END
pro numerical
COMMON FUNC_XY, P0, dP
P0=[60., 80.]      ;initial starting point
dP=[27., 20.]
.......................
```

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i get a much higher S_max of 0.012, which is pretty weird. Does anybody get what i mean and can maybe help me out???