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Subject: Re: summation and 3d plot

Posted by [pfp](#) on Tue, 27 Oct 2009 10:54:15 GMT

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On Oct 27, 6:19 am, Nicki <nickireite...@yahoo.de> wrote:

```
> Hey!
> I have two problems... First of all I need to sum up something. it
> should be pretty easy but i just get really confused with my arrays.
> first i have the following:
> nx=findgen(64.)
> ny=findgen(64.)
> for i=0,63 do begin
> for j=0,63 do begin
> x0=(30./32.*(0.5+nx[i]))-30.
> y0=(30./32.*(0.5+ny[j]))-30.
> .....
> N=findgen(10.)
> r0=sqrt(x0^2+y0^2)
> if (r0 gt 30.) then S=0 $ ; as it's an area of an circle with radius
> 30 (but not important for my problem)
> else begin
> for k=0,9 do begin
> phi=N[k]*36*pi/180
> x=abs(x0*cos(phi)+y0*sin(phi))
> y=-x0*sin(phi)+y0*cos(phi)
> h=50.-y
> deffs=sqrt(d^2+2/mu*tan(a/2*pi/180))
> S=deffs^2*(sin(atan(x/(h))))^3/(4*h)^2*100
> deffr=d+alog(2)/mu*tan(a/2*pi/180)
> R=sqrt((h/f*ri)^2+(deffr*(h+f)/f)^2)
> endfor
> endelse
> endfor
> endfor
> end
>
> So what i wanna do now is summing up all "S" over k like "stot=s[k=0]+s
> [k=1]+...+s[k=9]" and then i want to have a 3 D plot of x0, y0 and
> stot (however i have no idea how to do that either...).
> i know that a summation is usually done with "total(s)" but i don't
> know how to tell idl that it should be a summation over k. And i know
> that there are different ways how to do the 3D plot, but i don't
> really get the commands...
> i actually only want to have a 3D surface plot...
>
```

First, let me say that this can probably be done without loops (I only say probably, instead of surely, because of what may happen in

the ..... lines). But that is another story.

It seems that what you want at the end is a variable (I will call it `S_plot`) that is a function of `x0` and `y0`. So at that point `S_plot` should be a 2D array of dimensions 64,64. But this sum you mention means that this `S_plot` comes from summing some variable `S` that you calculate, which is a function of `x0`, `y0` and `phi` over `phi`. So this `S` must be a 3D array, with dimensions 64,64,N. Also, at the end you need a 1D array with the values of `x0`, and a 1D array with the values of `y0`, to make the surface plot.

With that in mind, your code should look more like

```
nx=findgen(64)
ny=findgen(64)
x0=(30./32.*(0.5+nx))-30.
y0=(30./32.*(0.5+ny))-30.
N=findgen(10)
S=dblarr(n_elements(nx),n_elements(ny),n_elements(N))
phi=N*36*pi/180
for i=0,n_elements(nx) do begin
  for j=0,n_elements(ny) do begin
    .....
    r0=sqrt(x0[i]^2+y0[j]^2)
    if (r0 gt 30.) then S[i,j,*]=0 else begin
      x=abs(x0*cos(phi)+y0*sin(phi))
      y=-x0*sin(phi)+y0*cos(phi)
      h=50.-y
      deffs=sqrt(d^2+2/mu*tan(a/2*pi/180))
      S[i,j,*]=deffs^2*(sin(atan(x/(h))))^3/(4*h)^2*100
      deffr=d+alog(2)/mu*tan(a/2*pi/180)
      R=sqrt((h/f*ri)^2+(deffr*(h+f)/f)^2)
    endelse
  endfor
endfor
S_plot=total(S,3)
isurface,S_plot,x0,y0
end
```

Note that now `x0`, `y0`, `phi`, `x`, `y`, `h` and `R` are 1D arrays, and `S` is a 3D array. Also I got rid of the loop in `phi`, it was unnecessary, it was just cluttering and slowing the code. As I said, the loops over `i` and `j` are probably unnecessary too.