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Subject: Re: Polar treatment of a 2D array  
Posted by [bowman](#) on Thu, 22 Apr 1999 07:00:00 GMT  
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In article <371E77DE.6740C7B8@cs.oberlin.edu>, Jim Sheckard  
<jsheckar@cs.oberlin.edu> wrote:

> I am currently working on a pulsar project, and we have found that the  
> ability to select points out of a polar slice of an array would be very  
> useful to our work. I was about to start implementing this particular  
> routine when it was suggested that someone might already have done this.  
> So my question is: Does anyone have a routine that will select points  
> out of an angular region of an array, or one that takes an average over  
> such a region? If not, then I'll just try to implement it, but I  
> thought I'd check. Thank you for your time.

Something like this should work:

```
sz = SIZE(a)                ;Get size of array
nx = sz[1]                  ;Get size of x-dimension
ny = sz[2]                  ;Get size of y-dimension
n = nx > ny                 ;Find largest dimension in
case array is not square

x = FINDGEN(nx)/n # REPLICATE(1.0, ny)    ;Create 'x-coordinates' of
each array element
y = REPLICATE(1.0, nx) # FINDGEN(ny)/n    ;Create 'y-coordinates' of
each array element
r = SQRT(x^2 + y^2)          ;Just in case you need it
```

This assumes that the cells of the array are square and the origin is at the lower left corner (first quadrant convention). If not, you will need to change how x and y are computed.

You need to decide what to do at the point (0,0), since ATAN is undefined there. The best solution is probably to put the origin somewhere other than exactly at a grid point (i.e., the center of the array, with nx or ny even, rather than the corner). Or you can handle it as a special case.

Then do

```
theta = ATAN(y, x)          ;Compute polar angle
slice = WHERE((theta GT theta_min) AND (theta LT theta_max), count) ;Find
points in slice
mean = TOTAL(a[slice])/count
```

(I can't remember the order of the arguments in ATAN. Check to be sure.)

