Subject: Re: creating a 2D mask for image filtering
Posted by David Higgins on Wed, 17 Aug 2011 16:44:23 GMT
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Thanks for the advice, very much appreciated. I followed your general method as follows, but actually it's not the filter shape I want:

```
FUNCTION CIRCLE, xcenter, ycenter, radius
  points = (2 * !PI / 99.0) * FINDGEN(100)
  x = xcenter + radius * COS(points )
  y = ycenter + radius * SIN(points )
  RETURN, TRANSPOSE([[x],[y]])
  END

PRO apod_filter
   image = dist(512)
   WINDOW, 0, TITLE = 'Test data before filtering'
   SHADE_SURF, image
   s = Size(image, /Dimensions)
   hf = Hanning(s[0], s[1], ALPHA=0.5)
   maxRadius = Min(s)/2;
   WINDOW, 1, TITLE = 'temporary window', xsize=s[0], ysize=s[1]
   ; Use of data coords for "circle" ok since data extent may not be square
   POLYFILL, CIRCLE(s[0]/2-1, s[1]/2-1, 0.8*maxRadius), color=1
   circleMask = TVRD()
   WDELETE, 1
   indices = Where(circleMask EQ 1)
   hf[indices] = 1
   WINDOW, 2, TITLE = 'Filter to be applied'
   SHADE_SURF, hf
   WINDOW, 3, TITLE = 'Apodized image'
   SHADE_SURF, hf*image
   WDELETE, 0, 3
END
```

This produces a step down at the edge of the circle, to where the Hanning window was before the circleMask was applied. But this step-down causes Gibbs ringing in a FT of the data.
I was aiming for a smooth "S" shaped (or similar) reduction of the filter values from the edge of the circle to the edge of the data.
I was wondering if I applied some sort of smoothing to circleMask, it would blur the edge of the circle and achieve the smooth decent at the circle edge:

```
PRO apod_filter
   image = dist(512)
   WINDOW, 0, TITLE = 'Test data before filtering'
   SHADE_SURF, image
   s = Size(image, /Dimensions)
   maxRadius = Min(s)/2;
```

```
   WINDOW, 1, TITLE = 'temporary window', xsize=s[0], ysize=s[1]
   ; Use of data coords for "circle" ok since data extent may not be square
   POLYFILL, CIRCLE(s[0]/2-1, s[1]/2-1, 0.8*maxRadius), color=1
   circleMask = float(TVRD())
   WDELETE, 1
   help, circlemask
   circleMask = SMOOTH(circleMask, 100, /EDGE_TRUNCATE, MISSING=0.0)
   indices = Where(circleMask GT 0.01)
   filter = fltarr(s[0], s[1])
   filter[indices] = circleMask[indices]
   WINDOW, 2, TITLE = 'Filter to be applied'
   SHADE_SURF, filter
   WINDOW, 3, TITLE = 'Apodized image'
   SHADE_SURF, filter*image
   WDELETE, 0, 3
END
```

...but this smoothing eats back into my leave-it-alone circle of data; I'd like to start the descent to zero at the edge of the originally defined circleMask.

Thanks for any further help.
