Subject: dimensional headache
Posted by Margrethe on Fri, 01 Apr 2005 16:49:17 GMT
View Forum Message <> Reply to Message

I'm developing a two-dimensional model and to save computational time I've tried to avoid for-loops whereever I could and used matrices instead. I thought I had it all figured out, but I'm doing something wrong...I'd be grateful if someone could tell me what's wrong with the following:

The model lies on a grid xgrid=findgen(160), ygrid=findgen(160). I want to calculate the numerical value of the model at the coordinate xmod,ymod

Here's my old code using for loops

```
for i=0,159 do begin
  for j=0,159 do begin
    dx_sqr = ( xmod - xgrid (i) )^2.
    dy_sqr = ( ymod - ygrid (j) )^2.
    d = sqrt ( dx_sqr + dy_sqr )
;   don't take the wings of the psf into account
    indx = where (d lt  (3. * (fwhm/2.35) ) ,ct)

    if (ct gt 0) then begin
      vel_p = ( vel_sys + v_rad(i,j) )
      psf = gaussfunc(st_dev,xgrid(i),ygrid(j),xmod,ymod )
      lineprof(i,j) = lineprof(i,j) + $
          total ( psf * image(i,j) * $
          exp( (vel - vel_p(i,j))^2./(-2.*v2)) )
    endif

  endfor
endfor
```

The above example works fine, but of course takes a long time to compute.
Here's my attempt with matrices, which doesn't give the correct output.

```
      dx_sqr = (xmod - findgen(160))^2.
      dy_sqr = (ymod - findgen(160))^2.

;     expand one dimension
      dx_sqr_expand = rebin(dx_sqr,160,160)
      dy_sqr_expand = transpose(rebin(dy_sqr,160,160))

      d = sqrt(dx_sqr_expand + dy_sqr_expand)
```

```
;     don't take the wings of the psf into account

      WhereToMulti,d,where(d lt (3.*(fwhm/2.35)),ct),colindx,rowindx

      vel_p = (vel_sys + v_rad(colindx,rowindx))

      psf = gaussfunc(st_dev,xgrid(colindx),ygrid(rowindx),xmod,ymod)

      lineprof(k,l) = lineprof(k,l) + $
          total( psf * image(colindx,rowindx) * $
          exp( (vel - vel_p(colindx,rowindx))^2./(-2.*v2)) )
```