Subject: Re: sample/empirical variogram calculation
Posted by james-a-roo on Thu, 06 Nov 2008 05:58:59 GMT
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hmmm... that dosent post very well. I'd provide a link but i'm
currently without a place to really post the code.

here are the rough examples. at least these may be useful to someone
doing some 4am hacking.

```
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;


;; ************************************************************ ****
;; code supplied as is. use at own risk, no warranties expressed,
;; implied, or infered.
;; ************************************************************ ***

!p.charsize=1.5

IF 0 THEN BEGIN

  x=[0,1,1,0,.2, 1, 0,-.2,1.60001]
  y=[0,0,1,1,.2,-1,-1,-.2,  0    ]
  v=[0,1,1,1,.1, 3, 3,-.2,1.6    ]
  loadct,39,/silent
  plot,x,y,color=0,psym=2
  loadct,33,/silent
  plots,x,y,color=bytscl(v),psym=2,thick=5
  loadct,39

  radiusbins=.8D
  thetabins=2D
   r=variogram(x=x,y=y,radiusbins=radiusbins,thetabins=thetabin s,v=v,/
double)

  ;;now bins are being passed in from above.
   r2=variogram(x=x,y=y,radiusbins=radiusbins,thetabins=thetabi ns,v=v,/
double)

  phibins=2

 r3=variogram(x=x,y=y,radiusbins=radiusbins,thetabins=thetabi ns,phibins=phibins,v=v,/
double)

  z=randomu(seed,9)

 r4=variogram(x=x,y=y,z=z,radiusbins=radiusbins,thetabins=the tabins,phibins=phibins,v=v,/
```

```
double)

 ENDIF

IF 1 THEN BEGIN

   nside=72L
   smoothwidth=15
   x=double(floor(findgen(nside,nside)/nside))
   y=reform(transpose(x),[nside^2])
   x=reform(x,[nside^2])

   ; z=reform(findgen(nside,nside),[nside^2])
   v=randomn(seed,nside,nside)
   window,0,xs=1200,ys=800
   !p.multi=[0,3,2]
   tvscale,v,/nointerp
   !p.multi[0]=!p.multi[0]-2
   v=reform(v,[nside^2])
   radiusbins=5.D  ;width
   thetabins=3.D    ;number of divisions

 r=variogram(x=x,y=y,radiusbins=radiusbins,thetabins=thetabin s,cum=cumu,
v=v,/double)
   nbins=n_elements(radiusbins)-2
   binstarts=radiusbins[0:nbins]
   plot,binstarts,r[*,0],yr=[0,max(r)],/ys
   FOR d=0,n_elements(thetabins)-2 DO
oplot,binstarts,r[*,d],color=d*254/2., thick=2
   !p.multi[0]=!p.multi[0]+3
;   plot,cumu[*,0]
;   FOR d=0,n_elements(thetabins)-2 DO oplot,cumu[*,d],color=d*50.,
thick=2

   ;; copy the original data
   v0=reform(v,[nside,nside])

   v=smooth(v0,floor(smoothwidth*[1.,1./smoothwidth]),/edge) ; smooth
anisotropically
   tvscale,reform(v),/nointerp
   !p.multi[0]=!p.multi[0]-2
   v=reform(v,[nside^2])

 r=variogram(x=x,y=y,radiusbins=radiusbins,thetabins=thetabin s,cum=cumu,
v=v,/double)
   nbins=n_elements(radiusbins)-2
   binstarts=radiusbins[0:nbins]
   plot,binstarts,r[*,0],yr=[0,max(r)],/ys
```

```
   FOR d=0,n_elements(thetabins)-2 DO
oplot,binstarts,r[*,d],color=d*254/2., thick=2
   !p.multi[0]=!p.multi[0]+3

   v=smooth(v0,floor(smoothwidth),/edge)  ;isotropic
   tvscale,reform(v),/nointerp
   !p.multi[0]=!p.multi[0]-2
   v=reform(v,[nside^2])

 r=variogram(x=x,y=y,radiusbins=radiusbins,thetabins=thetabin s,cum=cumu,
v=v,/double)
   nbins=n_elements(radiusbins)-2
   binstarts=radiusbins[0:nbins]
   plot,binstarts,r[*,0],yr=[0,max(r)],/ys
   FOR d=0,n_elements(thetabins)-2 DO
oplot,binstarts,r[*,d],color=d*254/2., thick=2

 ENDIF

IF 0 THEN BEGIN

  nside=50^2
  x=randomu(seed,nside)-.5
  y=randomu(seed,nside)-.5
  z=randomu(seed,nside)-.5
  v=sqrt( x^2. + y^2. + z^2. )

;  x=x[sort(v)]
;  y=y[sort(v)]
;;  z=z[sort(v)]
;  v=v[sort(v)]

  loadct,39,/silent
  window,1,xs=800,ys=800
  SURFACE, DIST(5), /NODATA, /SAVE, XRANGE=[0,1]-.5, $  ;thanks David,
the RSI examples are worthless.
         YRANGE=[0,1]-.5, ZRANGE=[0, 1]-.5, XSTYLE=1, $
         YSTYLE=1, ZSTYLE=1, CHARSIZE=1.5, $
         POSITION=[0.1, 0.1, 0.95, 0.95, 0.1, 0.95], $
         XTICKLEN=1, YTICKLEN=1, XGRIDSTYLE=1, YGRIDSTYLE=1
  AXIS, XAXIS=1, /T3D, CHARSIZE=1.5
  AXIS, YAXIS=1, /T3D, CHARSIZE=1.5

  phi = Findgen(32) * (!PI * 2 / 32.)
  phi = [ phi, phi(0) ]
  UserSym, Cos(phi), Sin(phi), /Fill
  loadct,33,/silent
  PLOTS, x, y, z, PSYM=8, COLOR=bytscl(v), SYMSIZE=2.5, /T3D
```

```
  plots, [0,0],[0,0],[-1,1]*.5,/t3d,thick=2
  plots, [0,0],[-1,1]*.5,[0,0],/t3d,thick=2
  plots, [-1,1]*.5,[0,0],[0,0],/t3d,thick=2
;  FOR pp=0,nside-1 DO plots,[0,x[pp]],[0,y[pp]],[0,z[pp]],/t3d
  loadct,39,/silent

  radiusbins=.05
  thetabins=[-1D*!dpi/2.D, .1D, !dpi/2.D]  ;2  ;trying regular and
irregularly specified bins
  phibins=[0.D, (!dpi/(2.D))-1D, !dpi]  ;2
  r=variogram(x=x,y=y,z=z,$

radiusbins=radiusbins,thetabins=thetabins,phibins=phibins,$
                cum=cumu, v=v,/double)
  nbins=n_elements(radiusbins)-2
  binstarts=radiusbins[0:nbins]
  window,2,xs=800,ys=800
  plot,binstarts,r[*,0,0],yr=[0,max(r)]
  FOR t=0,1 DO FOR p=0,1 DO
oplot,binstarts,r[*,t,p],color=((t*2)+p)*254/3.


ENDIF

END
```