
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 doesn't 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 inferred.  
.. *****  
;;
```

```
!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=thetabins,v=v,  
double)
```

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

```
  phibins=2
```

```
  r3=variogram(x=x,y=y,radiusbins=radiusbins,thetabins=thetabins,phibins=phibins,v=v,  
double)
```

```
  z=randomu(seed,9)
```

```
  r4=variogram(x=x,y=y,z=z,radiusbins=radiusbins,thetabins=thetabins,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=thetabins,cum=cumu,
v=v,/double)
    nbins=n_elements(radiusbins)-2
    binstarts=radiusbins[0:nbins]
    plot,binstarts,r[*],yr=[0,max(r)],/ys
    FOR d=0,n_elements(thetabins)-2 DO
oplot,binstarts,r[*],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[*],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=thetabins,cum=cumu,
v=v,/double)
    nbins=n_elements(radiusbins)-2
    binstarts=radiusbins[0:nbins]
    plot,binstarts,r[*],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=thetabins,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, X RANGE=[0,1]-.5, $ ;thanks David,
the RSI examples are worthless.
Y RANGE=[0,1]-.5, Z RANGE=[0, 1]-.5, X STYLE=1, $
Y STYLE=1, Z STYLE=1, CHAR SIZE=1.5, $
POSITION=[0.1, 0.1, 0.95, 0.95, 0.1, 0.95], $
XTICKLEN=1, YTICKLEN=1, XGRIDSTYLE=1, YGRIDSTYLE=1
AXIS, X AXIS=1, /T3D, CHAR SIZE=1.5
AXIS, Y AXIS=1, /T3D, CHAR SIZE=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=bytsc1(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