

```
c      +-----+
c      + subroutine : co-variance matrix      +
c      +-----+
      subroutine covmat(lat,clat,sdevfg,sdevob,gscale
+          ,nana,latana,lonana,co)
      implicit none
      real    lat,clat,sdevfg,sdevob,gscale
      integer  nana
      real    latana(nana),lonana(nana),co(nana,nana)
      integer  k,l,kml
      real    clon,varian,diagon,dis2,cov
      real    pi

      pi = asin(1.)*2.
      clon = clat*cos(lat*pi/180.)
      varian = sdevfg*sdevfg
      diagon = varian + sdevob*sdevob
      do k=2,nana
         kml = k - 1
      do l=1,kml
         dis2 = ( ((latana(k)-latana(l))*clat)**2+
+              ((lonana(k)-lonana(l))*clon)**2 )
+              / gscale**2
         cov = varian*exp( -dis2 )
         co(k,l) = cov
         co(l,k) = cov
      enddo
      enddo
      do k=1,nana
         co(k,k) = diagon
      enddo
      return
      end
```