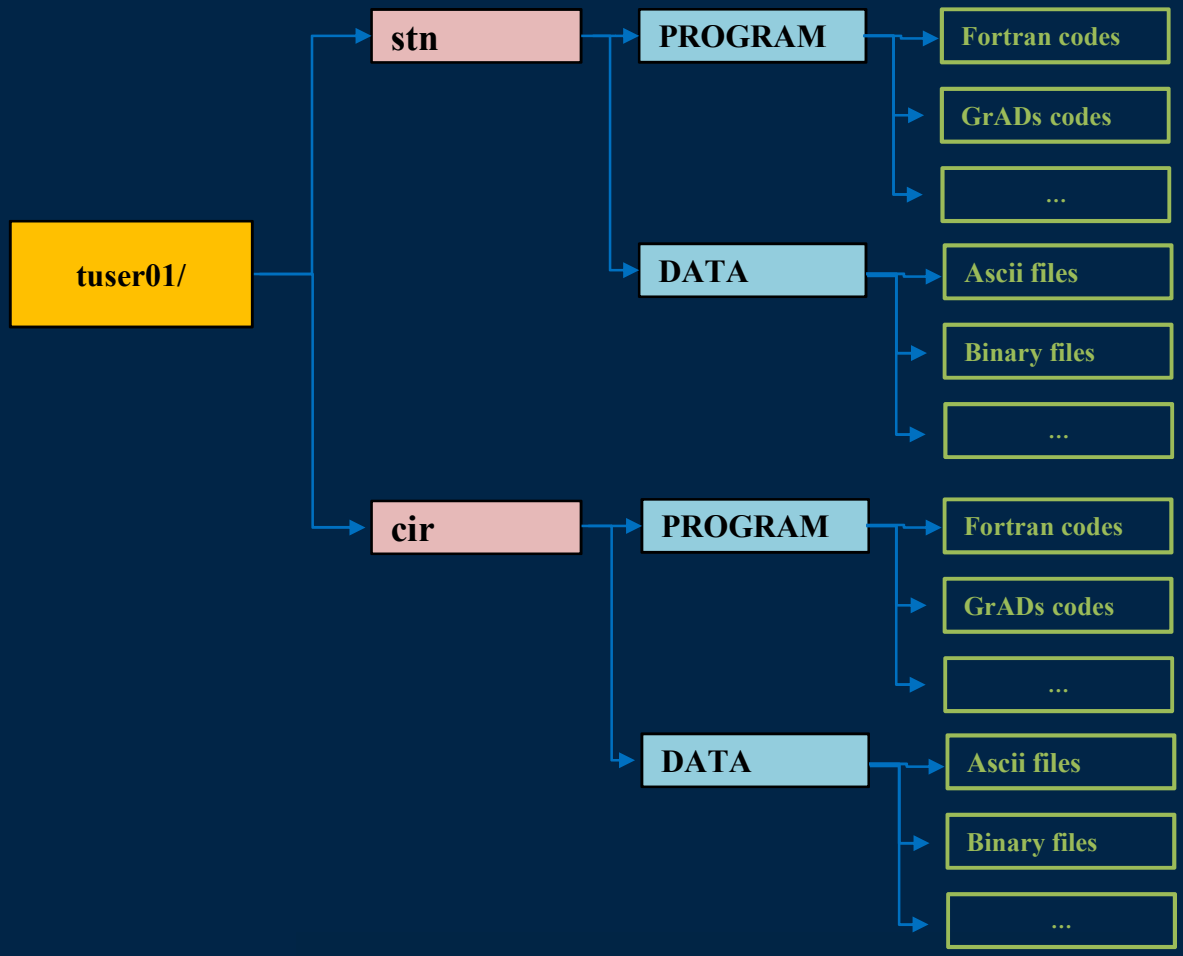
Station data

APCC APEC CLIMATE CENTER

Setup


tuser01/
stn
PROGRAM
Fortran codes
GrADs codes
...
DATA
Ascii files
Binary files
...
cir
PROGRAM
Fortran codes
GrADs codes
...
DATA
Ascii files
Binary files
...

Rule on File Naming

31.P.KR_8110_sta.asc
51.station89.txt

34.BSISO.INDEX.PHASE.txt

52.BSISO1.stn.comp.ctl
52.BSISO2.stn.comp.ctl

maskfile.MA
mask.MA.ctl

cd_stn 

cd_DATA 

Rule on File Naming

Nation	Abbrev.
Republic of Korea	KR
Pakistan	PK
Myanmar	MM
Thailand	TH
Malaysia	MY
Indonesia	ID
Vietnam	VN
India	IND
PNG	PNG
Taiwan	TPE
Bangladesh	BGD

Variable	Abbrev.
Temperature	T
Precipitation	P

Variable.Nation

Ex> P.KR → P.VN

Rule on File Naming

/stn/DATA/

31.P.KR_8110_sta.asc
51.station89.txt

34.BSISO.INDEX.PHASE.txt

52.BSISO1.stn.comp.ctl
52.BSISO2.stn.comp.ctl

maskfile.MA
mask.MA.ctl

P.KR → P.VN
8110 → 198101201012
89 → 55

PROGRAM

cir	stn
11.cir.ANO1.f90	01.stn.ANO1.f90
12.cir.ANO2.f90	02.stn.ANO2.f90
14.cir.BSISO1.COMP.f90	04.stn.BSISO1.COMP.f90
14.cir.BSISO2.COMP.f90	04.stn.BSISO2.COMP.f90
	05.stn.GSform.BSISO1.f90
	05.stn.GSform.BSISO2.f90
16.cir.BSISO1.COMP.gs	06.stn.BSISO1.COMP.gs
16.cir.BSISO2.COMP.gs	06.stn.BSISO2.COMP.gs

Anomaly Calculation

APCC APEC CLIMATE CENTER

01.stn.ANO1.f90

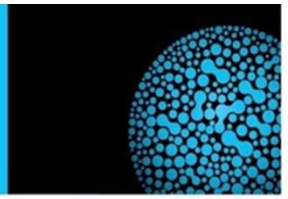
Removal of the first three harmonics in climatological annual cycle

#1. Extracting climatology

#2. Extracting first three harmonics in climatological annual cycle

	Input	Code	Output
1. Anomaly & climatology	**31.P.KR_8110_sta.asc**	***01.stn.ANO1.f90 (21.PARA.H)***	**32.P.KR.CLIM.asc 32.P.KR.198101201012.ANOS1.daily.asc**
2. Removal of moving average	32.P.KR.198101201012.ANOS1.daily.asc	*02.stn.ANO2.f90 (21.PARA.H)*	33.P.KR.198101201012.ANOS2.daily.asc
3. Separate BSISO indices into 8 phases	33.P.KR.198101201012.ANOS2.daily.asc 34.BSISO.INDEX.PHASE.txt	*03.BSISO.PHS.amp1.5.MJJASO.f90*	BSISO1.MJJASO.amp1.5.Phase1~8 BSISO2.MJJASO.amp1.5.Phase1~8
4.1 Composite variable	BSISO1.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	*04.stn.BSISO1.COMP.f90*	35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc
4.2 Composite variable	BSISO2.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	*04.stn.BSISO2.COMP.f90*	36.P.KR.19812010.MJJASO.BSISO2.amp1.5.COMP.asc

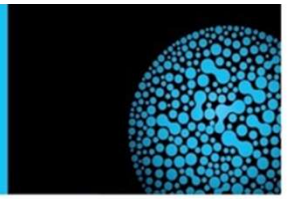
Anomaly [01.stn.ANO1.f90]



```
include  "./21.PARA.H"
integer :: isnum(ny)
real    :: val(ny,ntot),ano(ny,ntot)
real    :: gd(nx,ny), ave(nx,ny), num(nx,ny), var(nx,ny)
real    :: xx(nx,ny,nday), yy(nday), xano(nday)
real    :: clim1(nx,ny,nday), clim2(nx,ny,nday)
character*8 :: crec
```

```
OPEN(11,file='../DATA/31.P.KR_8110_sta.asc',status='old')

open (1,file='../DATA/32.P.KR.198101201012.ANOS1.daily.asc',status='unknown')
open (2,file='../DATA/32.P.K[illegible].CLIM.asc',status='unknown')

!-------READ Station Data
    read(11,666) crec,(isnum(i),i=1,89)
666 FORMAT ( a8,89i11 )

    jj=0
    do kyr=nyri,nyrf
    do iday=1,nday
        jj=jj+1
        read(11,333) iyr,imo,idy,(val(i,jj),i=1,89)
    enddo
    enddo

333 FORMAT ( i4.4,i2.2,i2.2,89f11.5 )
```

Anomaly [21.PARA.H]



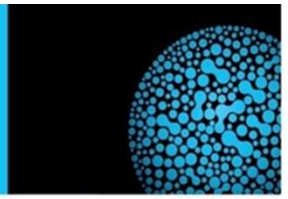
```
integer,parameter :: nx=1 , ny=89
integer,parameter :: nyri=1981, nyri2=1981, nyrf=2010, nyr=nyrf-nyri
integer,parameter :: nday=365, ndayf=365
integer,parameter :: ntot=nyr*nday+ndayf
data              dmiss/-999.0000/
~
~
~
```

The number of your station

Analysis period (Start year, End year)

Ex:VN) ny=55
nyri=1981, nyrf=2010

Anomaly [01.stn.ANO1.f90]



```
include  "./21.PARA.H"
integer :: isnum(ny)
real    :: val(ny,ntot),ano(ny,ntot)
real    :: gd(nx,ny), ave(nx,ny), num(nx,ny), var(nx,ny)
real    :: xx(nx,ny,nday), yy(nday), xano(nday)
real    :: clim1(nx,ny,nday), clim2(nx,ny,nday)
character*8 :: crec
```

Ex:VN)
31.P.VN_8110_sta.asc

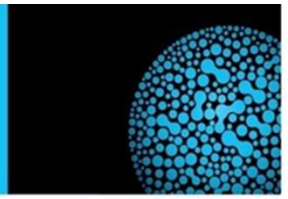
```
OPEN(11,file='../DATA/31.P.KR_8110_sta.asc',status='old')

open (1,file='../DATA/32.P.KR.198101201012.ANOS1.daily.asc',status='unknown')
open (2,file='../DATA/32.P.KR.CLIM.asc',status='unknown')
```

32.P.VN.198101201012.ANOS1.daily.asc

32.P.VN.CLIM.asc

```
!-------READ Station Data
    read(11,666) crec,(isnum(i),i=1,89)
666 FORMAT ( a8,89i11 )

    jj=0
    do kyr=nyri,nyrf
    do iday=1,nday
        jj=jj+1
        read(11,333) iyr,imo,idy,(val(i,jj),i=1,89)
    enddo
    enddo

333 FORMAT ( i4.4,i2.2,i2.2,89f11.5 )
```

Anomaly [01.stn.ANO1.f90]

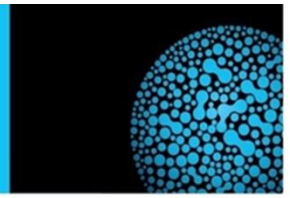


```
OPEN(11,file='../DATA/31.P.KR_8110_sta.asc',status='old')

open (1,file='../DATA/32.P.KR.198101201012.ANOS1.daily.asc',status='unknown')
open (2,file='../DATA/32.P.KR.CLIM.asc',status='unknown')

!-------READ Station Data
    read(11,666) crec,(isnum(i),i=1,89)
666 FORMAT ( a8,89i11 )

    jj=0
    do kyr=nyri,nyrf
    do iday=1,nday
        jj=jj+1
        read(11,333) iyr,imo,idy,(val(i,jj),i=1,89)
    enddo
    enddo

333 FORMAT ( i4.4,i2.2,i2.2,89f11.5 )

!-------Climatology (1981-2010)
do 100 iday = 1 , nday
     ave = 0. ; num = 0.
  do iyr = nyri , nyrf
      irec=(iyr-nyri)*nday+iday
     do i=1,89
      gd(1,i) = val(i,irec)
     enddo
      call JAVE1(ave,num,gd,nx,ny,dmiss)
  enddo
```

Ex:VN)

89 → 55

Anomaly [01.stn.ANO1.f90]



```
!---------anomaly
   var = 0.;inum=0
   do 300 iday = 1 , nday
     do 10 iyr = nyri , nyrf
       irec=(iyr-nyri)*nday+iday
       do i=1,89
         gd(1,i) = val(i,irec)
       enddo
         do jj = 1 , ny; do ii = 1 , nx
           if (gd(ii,jj).ne.dmiss .and. clim1(ii,jj,iday).ne.dmiss) then
              gd(ii,jj) = gd(ii,jj) - clim1(ii,jj,iday)
              inum = inum + 1
           else
              gd(ii,jj) = dmiss
           endif
        enddo;enddo
        do jj=1,ny
          ano(jj,irec)= gd(1,jj)
        enddo
 10 continue
300 continue

    do iday = 1 , nday
    do iyr = nyri , nyrf
      irec=(iyr-nyri)*nday+iday
      write(1,443) (ano(jj,irec),jj=1,ny)
    enddo
    enddo
443 FORMAT (89f11.4)
```

Ex:VN)

89 → 55

01.stn.ANO1.f90

Removal of the first three harmonics in climatological annual cycle

#1. Extracting climatology

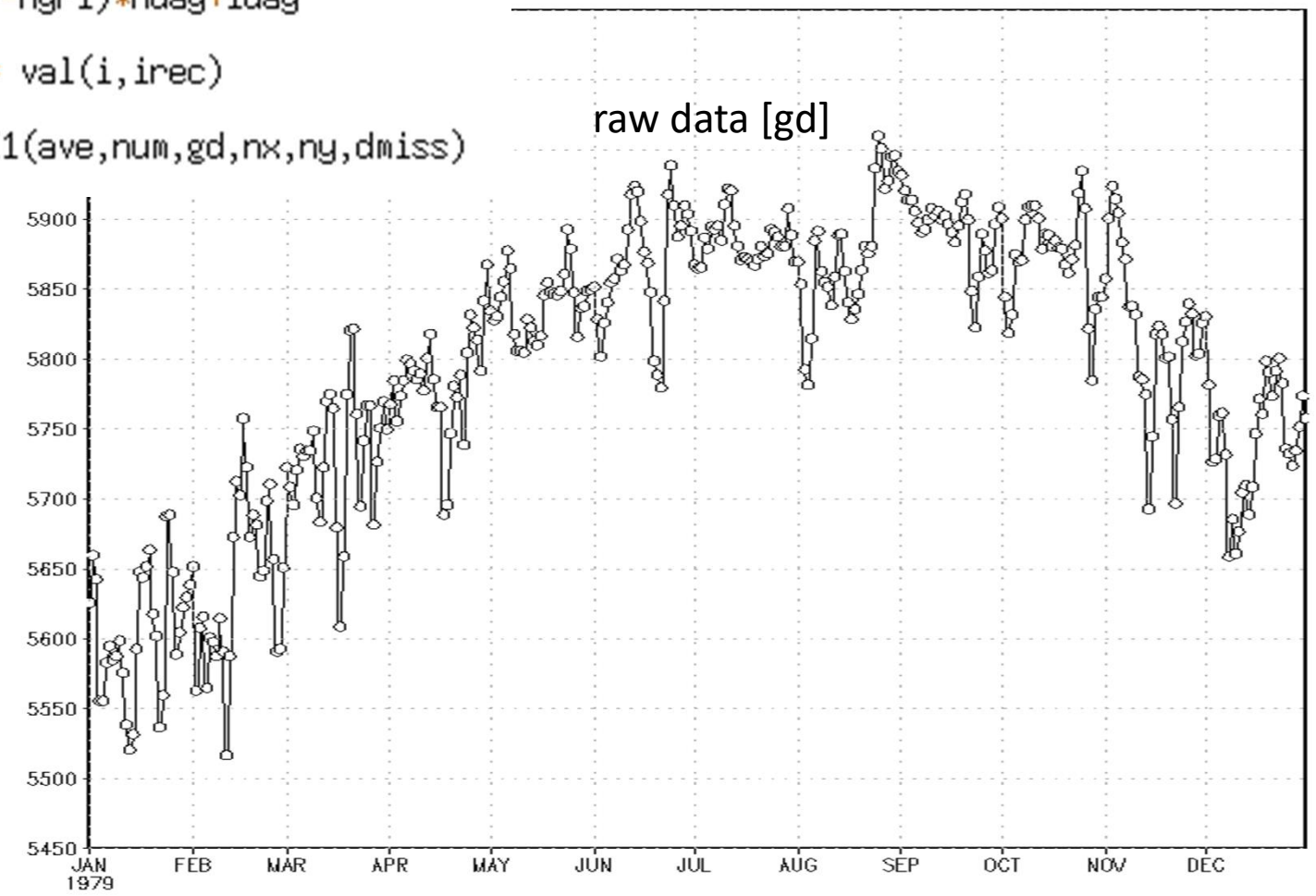
#2. Extracting first three harmonics of climatological annual cycle

Anomaly [01.stn.ANO1.f90]

```
!-------Climatology (1981-2010)
do 100 iday = 1 , nday
      ave = 0. ; num = 0.
   do iyr = nyri , nyrf
       irec=(iyr-nyri)*nday+iday
      do i=1,89
       gd(1,i) = val(i,irec)
      enddo
       call JAVE1(ave,num,gd,nx,ny,dmiss)
   enddo
```

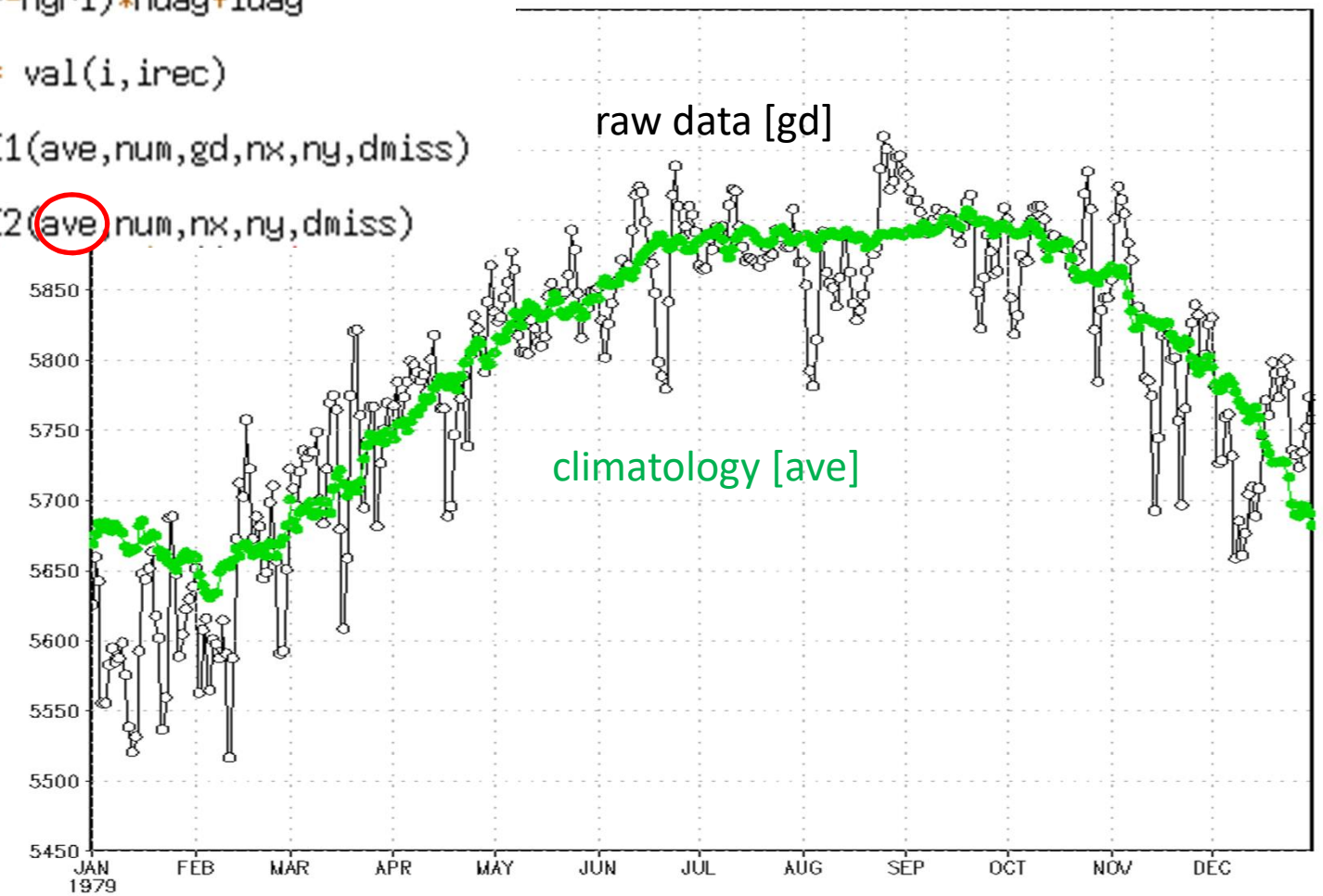
[Z500; 150E, 30N]

raw data [gd]



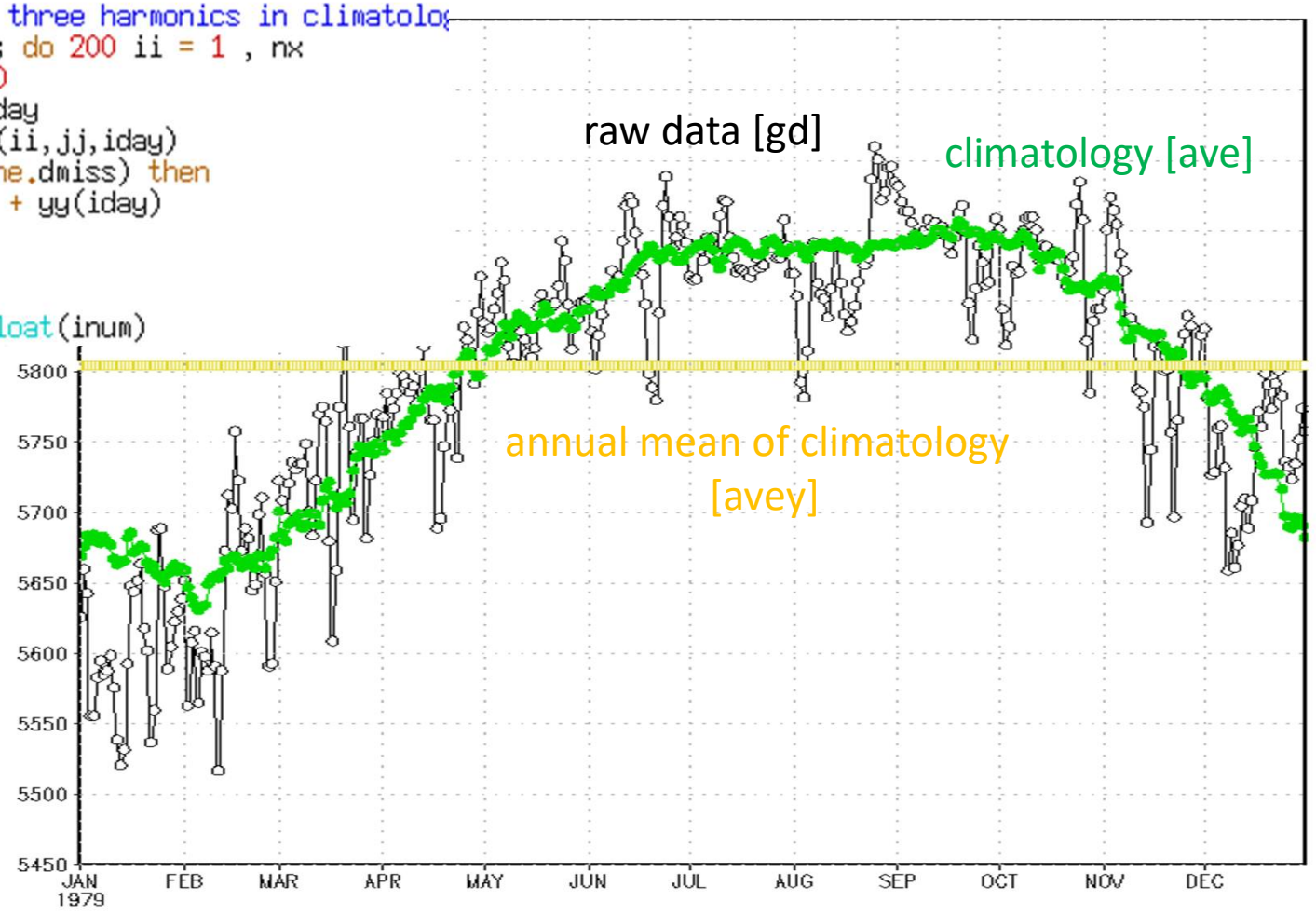
Anomaly [01.stn.ANO1.f90]

```
!-------Climatology (1981-2010)
do 100 iday = 1 , nday
      ave = 0. ; num = 0.
   do iyr = nyri , nyrf
       irec=(iyr-nyri)*nday+iday
      do i=1,89
       gd(1,i) = val(i,irec)
      enddo
       call JAVE1(ave,num,gd,nx,ny,dmiss)
   enddo
       call JAVE2(ave,num,nx,ny,dmiss)
```



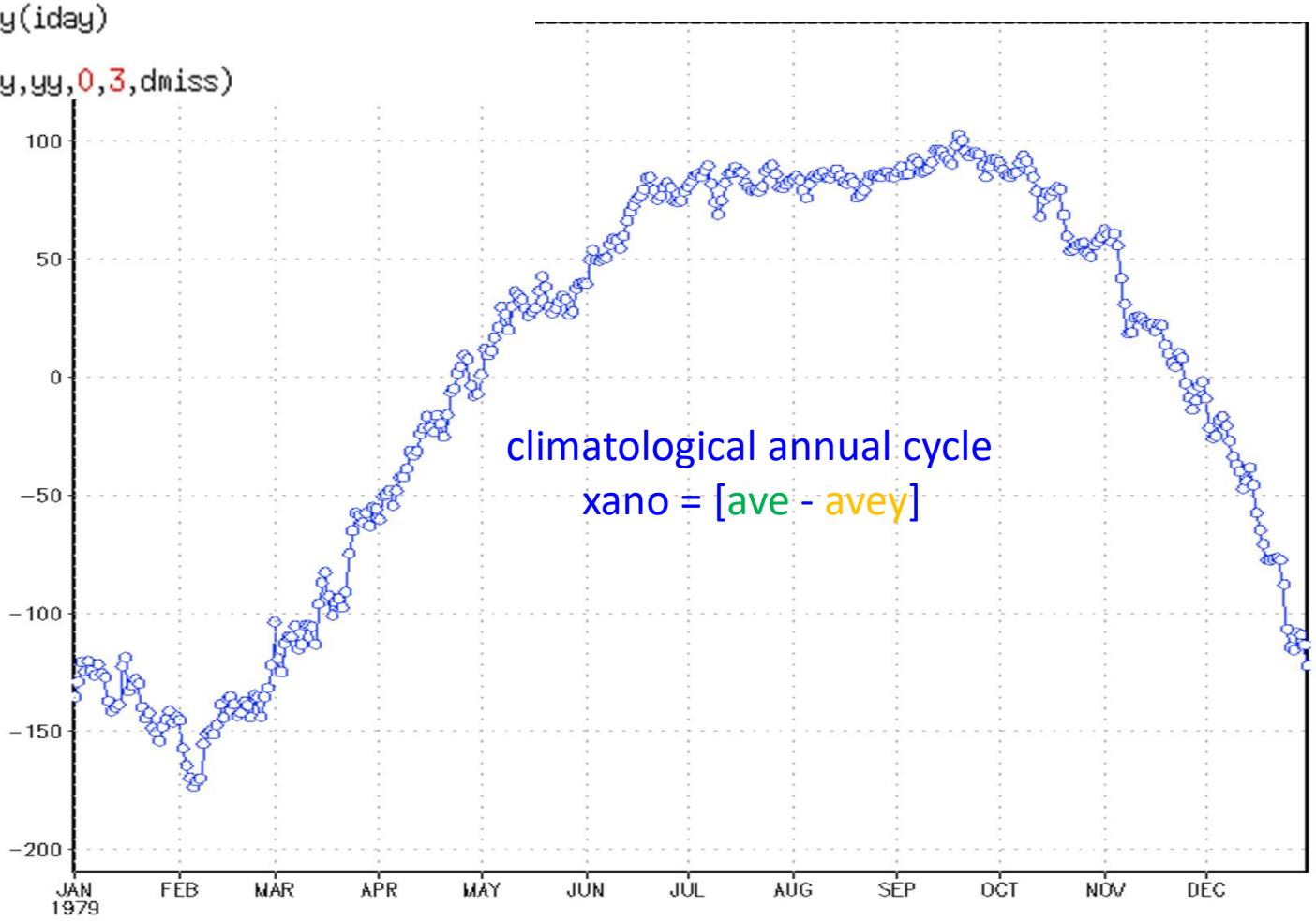
Anomaly [01.stn.ANO1.f90]

```
39        do jj = 1 , ny; do ii = 1 , nx
40         xx(ii,jj,iday) = ave(ii,jj)
41        enddo;enddo
42 100 continue
43
44         clim1 = dmiss
45         clim2 = dmiss
46
47 !--------The first three harmonics in climatolo
48 do 200 jj = 1 , ny; do 200 ii = 1 , nx
49    avey = 0.;inum=0
50    do iday = 1 , nday
51      yy(iday) = xx(ii,jj,iday)
52      if (yy(iday).ne.dmiss) then
53        avey = avey + yy(iday)
54        inum=inum+1
55      endif
56    enddo
57      avey = avey/float(inum)
```



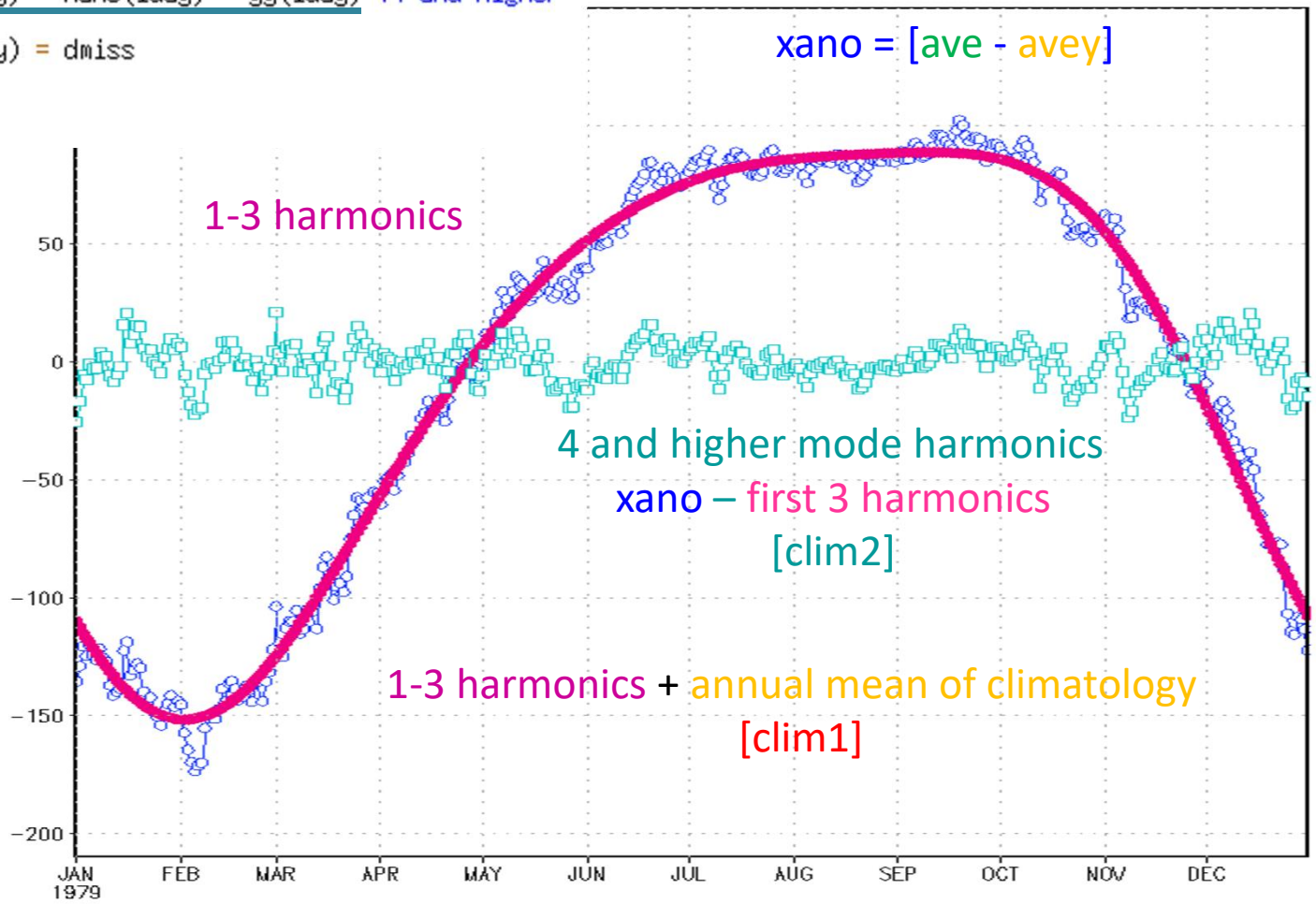
Anomaly [01.stn.ANO1.f90]

```
58    do iday = 1 , nday
59      if (yy(iday).ne.dmiss.and.avey.ne.dmiss) then
60        yy(iday) = yy(iday) - avey
61      else
62        yy(iday) = dmiss
63      endif
64      xano(iday) = yy(iday)
65    enddo
66      call ffltr(nday,yy,0,3,dmiss)
```



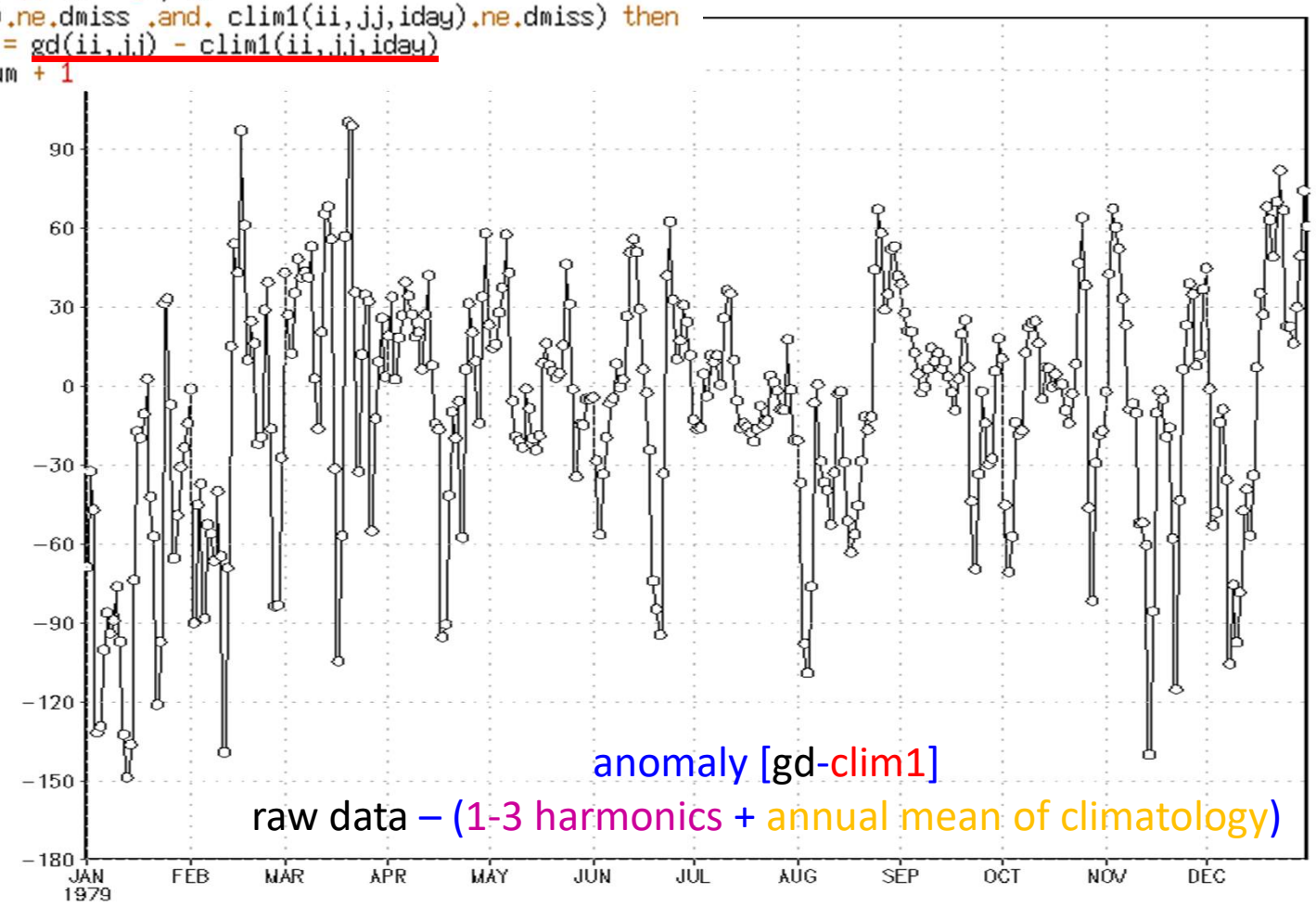
Anomaly [01.stn.ANO1.f90]

```
66      call ffltr(nday,yy,0.3,dmiss)
67    do iday = 1 , nday
68      if (yy(iday).ne.dmiss.and.avey.ne.dmiss) then
69        clim1(ii,jj,iday) = yy(iday) + avey        !0-3 harmonics
70      else
71        clim1(ii,jj,iday) = dmiss
72      endif
73      if (yy(iday).ne.dmiss.and.xano(iday).ne.dmiss) then
74        clim2(ii,jj,iday) = xano(iday) - yy(iday) !4 and higher
75      else
76        clim2(ii,jj,iday) = dmiss
77      endif
78    enddo
79 200 continue
```



Anomaly [01.stn.ANO1.f90]

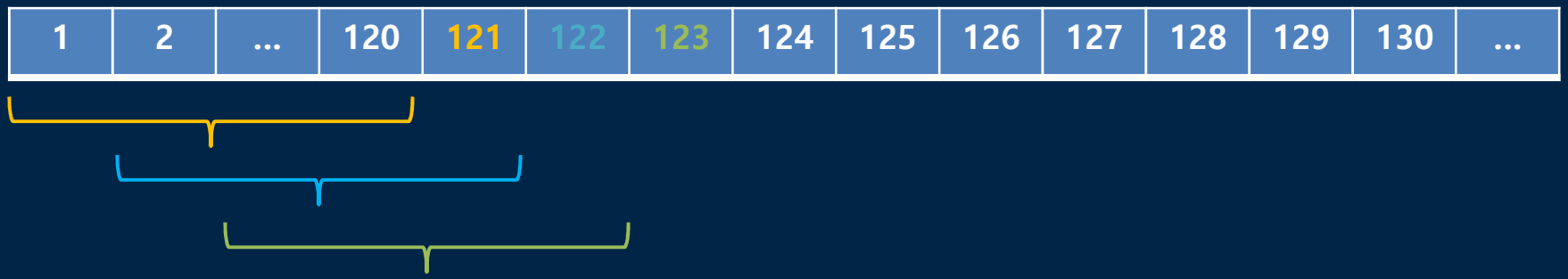
```
87 !---------anomaly
88    var = 0.;inum=0
89    do 300 iday = 1 , nday
90      do 10 iyr = nyri , nyrf
91        irec=(iyr-nyri)*nday+iday
92        do i=1,89
93          gd(1,i) = val(i,irec)
94        enddo
95          do jj = 1 , ny; do ii = 1 , nx
96            if (gd(ii,jj).ne.dmiss .and. clim1(ii,jj,iday).ne.dmiss) then
97               gd(ii,jj) = gd(ii,jj) - clim1(ii,jj,iday)
98               inum = inum + 1
```



02.stn.ANO2.f90

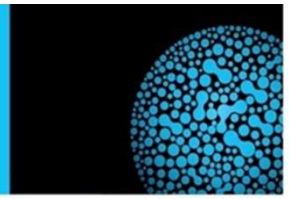
Removal of the effect of ENSO signal (interannual variability) through subtracting last 120-day mean

Julian day



	Input	Code	Output
1. Anomaly & climatology	31.P.KR_8110_sta.asc	*01.stn.ANO1.f90 (21.PARA.H)*	32.P.KR.CLIM.asc 32.P.KR.198101201012.ANOS1.daily.asc
2. Removal of moving average	**32.P.KR.198101201012.ANOS1.daily.asc**	***02.stn.ANO2.f90 (21.PARA.H)***	**33.P.KR.198101201012.ANOS2.daily.asc**
3. Separate BSISO indices into 8 phases	33.P.KR.198101201012.ANOS2.daily.asc 34.BSISO.INDEX.PHASE.txt	*03.BSISO.PHS.amp1.5.MJJASO.f90*	BSISO1.MJJASO.amp1.5.Phase1~8 BSISO2.MJJASO.amp1.5.Phase1~8
4.1 Composite variable	BSISO1.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	*04.stn.BSISO1.COMP.f90*	35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc
4.2 Composite variable	BSISO2.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	*04.stn.BSISO2.COMP.f90*	36.P.KR.19812010.MJJASO.BSISO2.amp1.5.COMP.asc

Anomaly [02.stn.ANO2.f90]



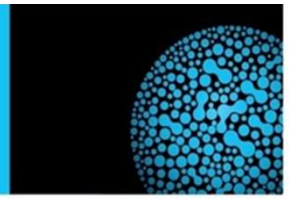
```
include  "./21.PARA.H"
real    ::  gd(nx,ny), gd2(nx,ny), ave(nx,ny), num(nx,ny)
real    ::  xx(ny,ntot),val(ny,ntot)

open (11,file='../DATA/32.P.KR.198101201012.ANOS1.daily.asc',status='old')
open (1,file='../DATA/33.P.KR.198101201012.ANOS2.daily.asc',status='unknown')

!-------- READ
    do iday=1,nday
    do iyr=nyri, nyrf
       irec=(iyr-nyri)*nday+iday
       read(11,553) (val(jj,irec),jj=1,ny)
    enddo
    enddo
!-------- READ

!-------- ANO
  do 2008 iyr = nyri , nyrf
   print *, iyr
  do 100 iday = 1 , nday
   irec=(iyr-nyri)*nday+iday
   IF (iyr.eq.nyri .and. iday.le.120) then
      do jj=1,89
        xx(jj,irec)=val(jj,irec)
      enddo
   ELSEIF (iyr.eq.nyrf .and. iday.gt.ndayf) then
     goto 100
   ELSE
```

Ex:VN)

33.P.VN.198101201012.ANOS2.daily.asc

32.P.VN.198101201012.ANOS1.daily.asc

Anomaly [02.stn.ANO2.f90]



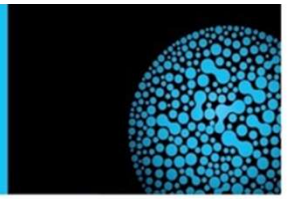
```
!--------- ANO
  do 2008 iyr = nyri , nyrf
   print *, iyr
  do 100 iday = 1 , nday
   irec=(iyr-nyri)*nday+iday
   IF (iyr.eq.nyri .and. iday.le.120) then
      do jj=1,89
        xx(jj,irec)=val(jj,irec)
      enddo
   ELSEIF (iyr.eq.nyrf .and. iday.gt.ndayf) then
     goto 100
   ELSE
     do jj=1,89
         gd(1,jj)=val(jj,irec)
     enddo
      ave = 0.; num = 0.
      do imov = 0 , 119     !last 120-day mean
       jrec=irec-imov
       do jj=1,89
         gd2(1,jj) = val(jj,jrec)
       enddo
       call JAVE1(ave,num,gd2,nx,ny,dmiss)
      enddo
     call JAVE2(ave,num,nx,ny,dmiss)
     DO jj = 1 , ny; DO ii = 1 , nx
      if (gd(ii,jj).ne.dmiss .and. ave(ii,jj).ne.dmiss) then
        gd(ii,jj) = gd(ii,jj) - ave(ii,jj)
      else
        gd(ii,jj) = dmiss
      endif
     ENDDO;ENDDO
     do jj=1,ny
     xx(jj,irec) = gd(1,jj)
     enddo
   ENDIF
 100 continue
2008 continue
```

Ex:VN)

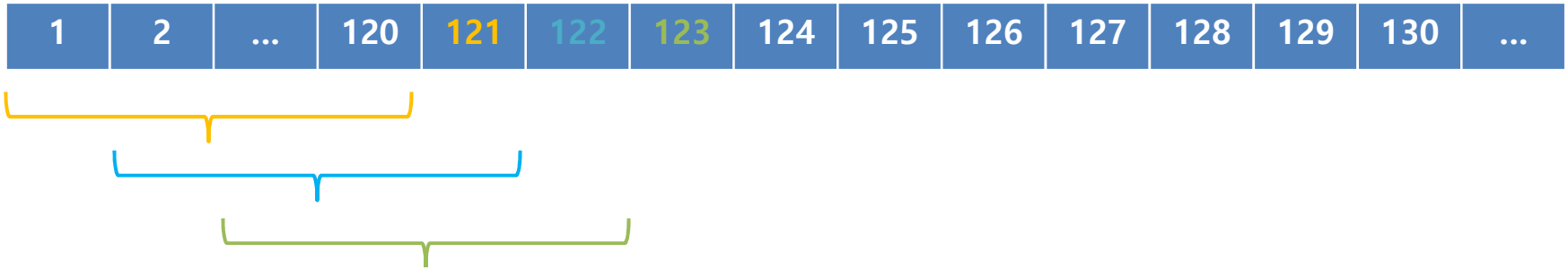
89 → 55

```
   DO iday = 1 , nday
   DO iyr = nyri , nyrf
      irec=(iyr-nyri)*nday+iday
     write(1,443) (xx(jj,irec),jj=1,ny)
   ENDDO
   ENDDO
443 FORMAT (89f11.4)
553 FORMAT (89f11.5)

stop
end
```

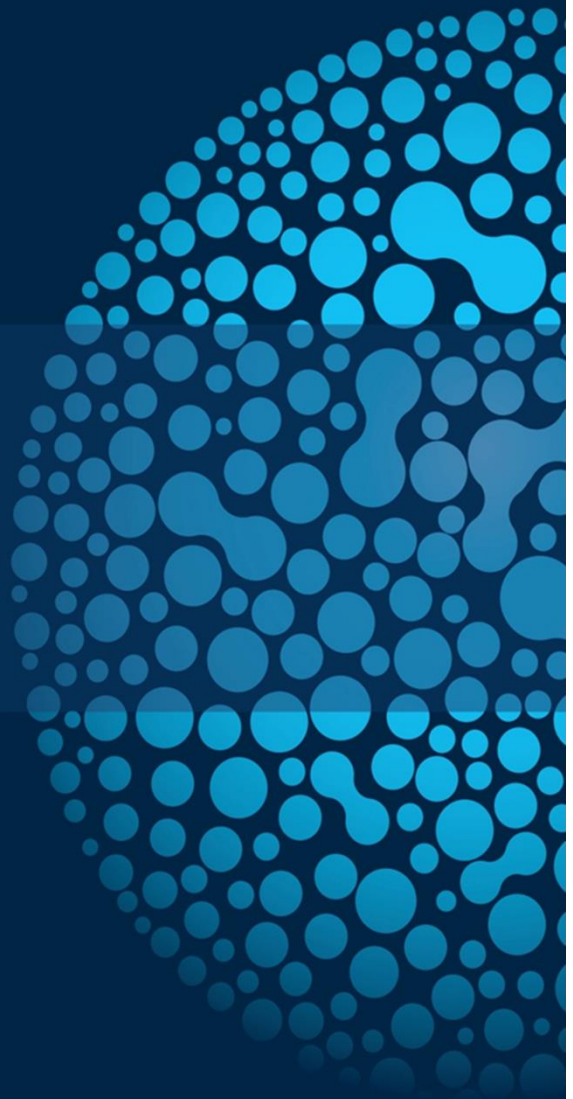
Anomaly [02.stn.ANO2.f90]



```
17 !--------- ANO
18   do 2008 iyr = nyri , nyrf
19    print *, iyr
20   do 100 iday = 1 , nday
21    irec=(iyr-nyri)*nday+iday
22    IF (iyr.eq.nyri .and. iday.le.120) then
23       do jj=1,89
24         xx(jj,irec)=val(jj,irec)
25       enddo
26    ELSEIF (iyr.eq.nyrf .and. iday.gt.ndayf) then
27      goto 100
28    ELSE
29      do jj=1,89
30          gd(1,jj)=val(jj,irec)
31      enddo
32       ave = 0.; num = 0.
33       do imov = 0 , 119     !last 120-day mean
34        jrec=irec-imov
35        do jj=1,89
36          gd2(1,jj) = val(jj,jrec)
37        enddo
38        call JAVE1(ave,num,gd2,nx,ny,dmiss)
39       enddo
40      call JAVE2(ave,num,nx,ny,dmiss)
41      DO jj = 1 , ny; DO ii = 1 , nx
42       if (gd(ii,jj).ne.dmiss .and. ave(ii,jj).ne.dmiss) then
43         gd(ii,jj) = gd(ii,jj) - ave(ii,jj)
44       else
45         gd(ii,jj) = dmiss
46       endif
47      ENDDO;ENDDO
```



Composite Analysis



APCC APEC CLIMATE CENTER

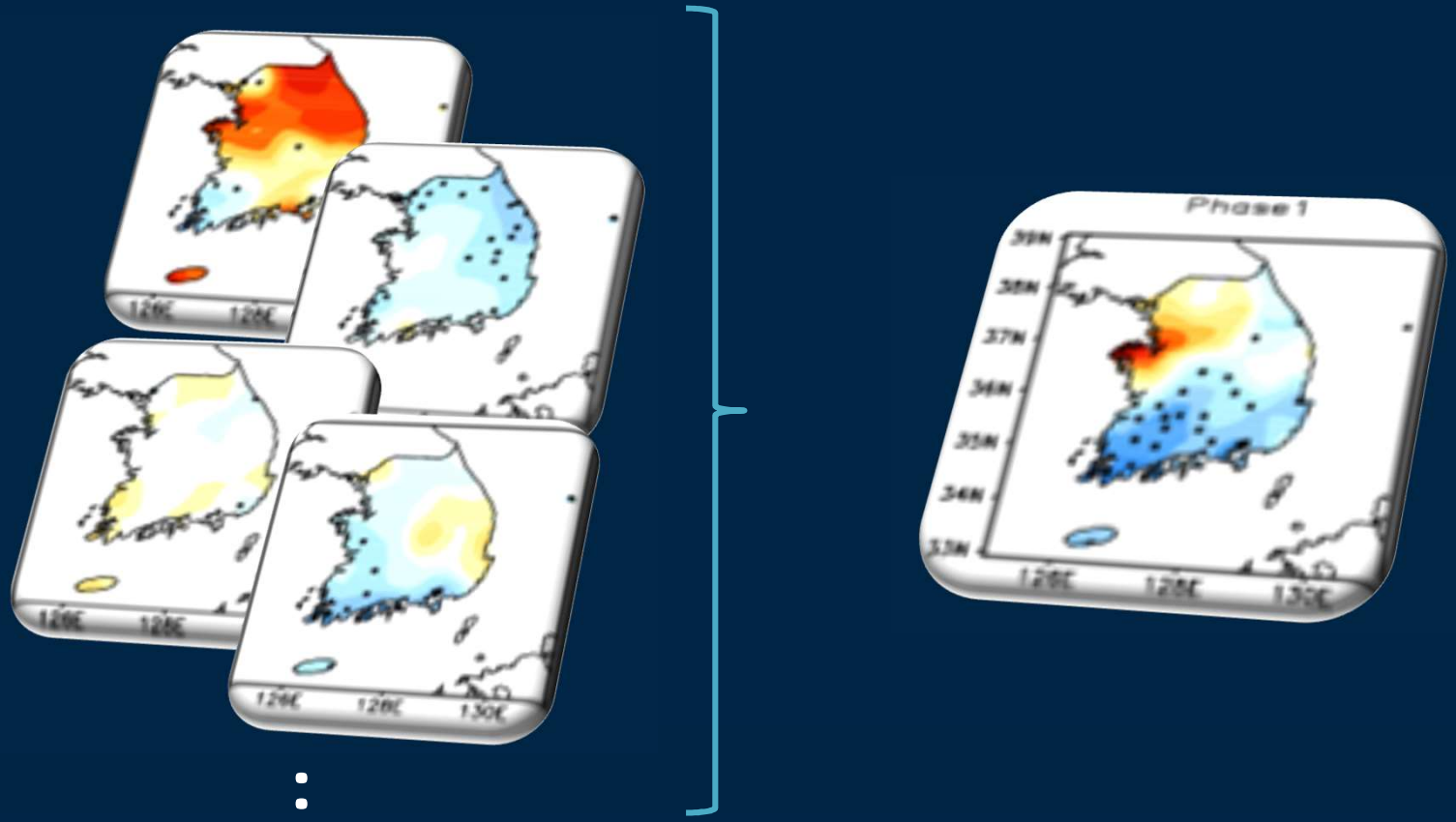
Flow

#1. Divide the BSISO indices into 8 phases

#2. Composite for local precipitation anomaly

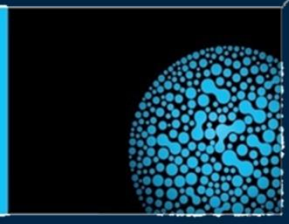
04.stn.BSISO1.COMP.f90
04.stn.BSISO2.COMP.f90

#2. Composite analysis for station data to show local impact of BSISO



	Input	Code	Output
1. Anomaly & climatology	31.P.KR_8110_sta.asc	*01.stn.ANO1.f90* *(21.PARA.H)*	32.P.KR.CLIM.asc 32.P.KR.198101201012.ANOS1.daily.asc
2. Removal of moving average	32.P.KR.198101201012.ANOS1.daily.asc	*02.stn.ANO2.f90* *(21.PARA.H)*	33.P.KR.198101201012.ANOS2.daily.asc
3. Separate BSISO indices into 8 phases	**33.P.KR.198101201012.ANOS2.daily.asc** **34.BSISO.INDEX.PHASE.txt**	***03.BSISO.PHS.amp1.5.MJJASO.f90***	**BSISO1.MJJASO.amp1.5.Phase1~8** **BSISO2.MJJASO.amp1.5.Phase1~8**
4.1 Composite variable	BSISO1.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	*04.stn.BSISO1.COMP.f90*	35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc
4.2 Composite variable	BSISO2.MJJASO.amp1.5.Phase1~8 33.P.KR.198101201012.ANOS2.daily.asc	*04.stn.BSISO2.COMP.f90*	36.P.KR.19812010.MJJASO.BSISO2.amp1.5.COMP.asc

03.BSISO.PHS.amp1.5.MJJASO.f90



#1. Divide the BSISO indices based on 8 phases

BSISO1.MJJASO.amp1.5.Phase1

1981 200	0.021	-1.636	1.636	1
1981 201	0.414	-1.457	1.515	1
1981 202	0.845	-1.356	1.598	1
1981 234	0.039	-1.610	1.610	1
1981 235	0.383	-1.642	1.686	1
1981 295	0.829	-1.304	1.545	1
1982 143	1.117	-1.350	1.752	1
1982 261	0.755	-1.712	1.871	1
1982 262	0.869	-1.493	1.727	1
1982 295	0.063	-1.909	1.910	1
1982 296	0.431	-1.851	1.901	1
1982 297	0.739	-1.756	1.905	1
1982 298	0.900	-1.203	1.502	1
1982 299	1.084	-1.106	1.549	1
1983 233	0.555	-1.441	1.544	1
...				

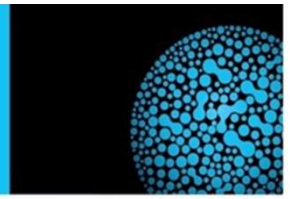
x8

BSISO2.MJJASO.amp1.5.Phase1

1981 198	0.949	-1.812	2.046	1
1981 208	0.674	-1.648	1.781	1
1981 209	1.075	-1.817	2.111	1
1981 212	1.841	-1.844	2.606	1
1981 213	1.705	-2.640	3.143	1
1981 214	1.154	-2.175	2.462	1
1981 257	0.771	-1.626	1.799	1
1981 258	1.397	-1.787	2.268	1
1981 290	0.256	-1.576	1.597	1
1981 299	1.003	-1.527	1.827	1
1982 138	0.034	-1.619	1.619	1
1982 144	1.066	-1.339	1.712	1
1982 145	1.326	-1.541	2.033	1
1982 251	0.855	-1.254	1.518	1
1983 196	1.519	-1.551	2.171	1
...				

x8

Composite [03.BSISO.PHS.amp1.5.MJJASO.f90]

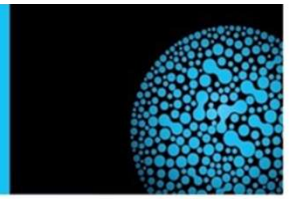


```
integer, parameter :: nyr=30, nmode=4
integer, parameter :: ndayt=365, ndayf=365  !!! modify
integer, parameter :: ntot=(nyr-1)*ndayt+ndayf
integer :: iyr, idy, irec, ip, inum, jnum
integer :: ico(8),jco(8)
integer :: iyear(ntot), iday(ntot), pp1(ntot), pp2(ntot)
real    ::  pc(nmode,ntot), amp(ntot), amp2(ntot)

open (1,file='../DATA/34.BSISO.INDEX.PHASE.txt',status='old')

open(31,file='../DATA/BSISO1.MJJASO.amp1.5.Phase1',status='unknown')
open(32,file='../DATA/BSISO1.MJJASO.amp1.5.Phase2',status='unknown')
open(33,file='../DATA/BSISO1.MJJASO.amp1.5.Phase3',status='unknown')
open(34,file='../DATA/BSISO1.MJJASO.amp1.5.Phase4',status='unknown')
open(35,file='../DATA/BSISO1.MJJASO.amp1.5.Phase5',status='unknown')
open(36,file='../DATA/BSISO1.MJJASO.amp1.5.Phase6',status='unknown')
open(37,file='../DATA/BSISO1.MJJASO.amp1.5.Phase7',status='unknown')
open(38,file='../DATA/BSISO1.MJJASO.amp1.5.Phase8',status='unknown')
open(41,file='../DATA/BSISO2.MJJASO.amp1.5.Phase1',status='unknown')
open(42,file='../DATA/BSISO2.MJJASO.amp1.5.Phase2',status='unknown')
open(43,file='../DATA/BSISO2.MJJASO.amp1.5.Phase3',status='unknown')
open(44,file='../DATA/BSISO2.MJJASO.amp1.5.Phase4',status='unknown')
open(45,file='../DATA/BSISO2.MJJASO.amp1.5.Phase5',status='unknown')
open(46,file='../DATA/BSISO2.MJJASO.amp1.5.Phase6',status='unknown')
open(47,file='../DATA/BSISO2.MJJASO.amp1.5.Phase7',status='unknown')
open(48,file='../DATA/BSISO2.MJJASO.amp1.5.Phase8',status='unknown')


read(1,*)
```

BSISO1

BSISO2

Composite [03.BSISO.PHS.amp1.5.MJJASO.f90]



```
ico=0;jco=0
irec=0
DO iyr=1,nyr
DO idy=1,ndayt
   irec = irec + 1
     IF(amp(irec).ge.1.5.and.idy.ge.121.and.idy.le.304) THEN !---- MJJASO
      DO ip=1,8
      inum = ip
        IF(pp1(irec).eq.ip) THEN
          WRITE(inum+30,100) iyear(irec),iday(irec),pc(1,irec),pc(2,irec),&
&                            amp(irec),pp1(irec)
          ico(inum) = ico(inum) + 1
        ENDIF
      ENDDO
     ENDIF
     IF(amp2(irec).ge.1.5.and.idy.ge.121.and.idy.le.304) THEN !---- MJJASO
      DO ip=1,8
      jnum = ip
        IF(pp2(irec).eq.ip) THEN
          WRITE(jnum+40,100) iyear(irec),iday(irec),pc(3,irec),pc(4,irec),&
&                            amp2(irec),pp2(irec)
          jco(jnum) = jco(jnum) + 1
        ENDIF
      ENDDO
     ENDIF
ENDDO
ENDDO
```

BSISO1

BSISO2

Composite [03.BSISO.PHS.amp1.5.MJJASO.f90]

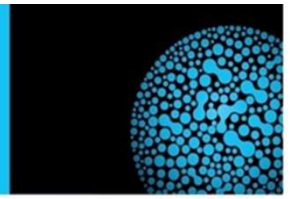
```
[shout@bsiso PROGRAM]$ pgf90 03.BSISO.PHS.amp1.5.MJJASO.f90
[shout@bsiso PROGRAM]$ ./a.out
 ---------------- BSISO 1-----------------
   P1    P2    P3    P4    P5    P6    P7    P8
  211   255   189   159   267   193   309   239

 ---------------- BSISO 2-----------------
   P1    P2    P3    P4    P5    P6    P7    P8
  225   255   235   209   212   228   225   231
[shout@bsiso PROGRAM]$
```

Composite [04.BSISO1.COMP.f90]

```
include  "./21.PARA.H"
real    ::  pavg(8,ny),val(ny,ntot)
real    ::  imsi
integer :: inum
integer :: pdate(8)
integer,dimension(8,309) :: year, jday

data  pdate / 211, 255, 189, 159, 267, 193, 309, 239 /
```

	Input	Code	Output
1. Anomaly & climatology	31.P.KR_8110_sta.asc	*01.stn.ANO1.f90* *(21.PARA.H)*	32.P.KR.CLIM.asc 32.P.KR.198101201012.ANOS1.daily.asc
2. Removal of moving average	32.P.KR.198101201012.ANOS1.daily.asc	*02.stn.ANO2.f90* *(21.PARA.H)*	33.P.KR.198101201012.ANOS2.daily.asc
3. Separate BSISO indices into 8 phases	33.P.KR.198101201012.ANOS2.daily.asc 34.BSISO.INDEX.PHASE.txt	*03.BSISO.PHS.amp1.5.MJJASO.f90*	BSISO1.MJJASO.amp1.5.Phase1~8 BSISO2.MJJASO.amp1.5.Phase1~8
4.1 Composite variable	**BSISO1.MJJASO.amp1.5.Phase1~8** **33.P.KR.198101201012.ANOS2.daily.asc**	***04.stn.BSISO1.COMP.f90***	**35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc**
4.2 Composite variable	**BSISO2.MJJASO.amp1.5.Phase1~8** **33.P.KR.198101201012.ANOS2.daily.asc**	***04.stn.BSISO2.COMP.f90***	**36.P.KR.19812010.MJJASO.BSISO2.amp1.5.COMP.asc**

Composite [04.BSISO1.COMP.f90]



```
include  "./21.PARA.H"
real    ::  pavg(8,ny),val(ny,ntot)
real    ::  imsi
integer :: inum
integer :: pdate(8)
integer,dimension(8,309) :: year, jday

data  pdate / 211, 255, 189, 159, 267, 193, 309, 239 /

open (11,file='../DATA/BSISO1.MJJASO.amp1.5.Phase1',status='old')
open (12,file='../DATA/BSISO1.MJJASO.amp1.5.Phase2',status='old')
open (13,file='../DATA/BSISO1.MJJASO.amp1.5.Phase3',status='old')
open (14,file='../DATA/BSISO1.MJJASO.amp1.5.Phase4',status='old')
open (15,file='../DATA/BSISO1.MJJASO.amp1.5.Phase5',status='old')
open (16,file='../DATA/BSISO1.MJJASO.amp1.5.Phase6',status='old')
open (17,file='../DATA/BSISO1.MJJASO.amp1.5.Phase7',status='old')
open (18,file='../DATA/BSISO1.MJJASO.amp1.5.Phase8',status='old')

open (1,file='../DATA/33.P.KR.198101201012.ANOS2.daily.asc',status='old')
open (33,file='../DATA/35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc',&
&     status='unknown')

!--------- READ Anomaly
    do iday=1,nday
    do iyr=nyri, nyrf
       irec=(iyr-nyri)*nday+iday
       read(1,200) (val(jj,irec),jj=1,ny)
    enddo
    enddo

year = dmiss
jday = dmiss

!--------- READ BSISO indices
    do ip=1,8
    do ik=1,pdate(ip)
       imun = 10+ip
       read(imun,100) year(ip,ik),jday(ip,ik)
    enddo
       close (imun)
    enddo
100 FORMAT(2x,i4.4,1x,i3.3)
200 FORMAT(89f11.5)
```

Ex:VN)

P.KR → P.VN

Ex:VN)

89 → 55

Composite [04.BSISO2.COMP.f90]

```
include  "./21.PARA.H"
real    ::  pavg(8,ny),val(ny,ntot)
real    ::  imsi
integer :: inum
integer :: pdate(8)
integer,dimension(8,255) :: year, jday

data  pdate / 225, 255, 235, 209, 212, 228, 225, 231 /

open (11,file='../DATA/BSISO2.MJJASO.amp1.5.Phase1',status='old')
open (12,file='../DATA/BSISO2.MJJASO.amp1.5.Phase2',status='old')
open (13,file='../DATA/BSISO2.MJJASO.amp1.5.Phase3',status='old')
open (14,file='../DATA/BSISO2.MJJASO.amp1.5.Phase4',status='old')
open (15,file='../DATA/BSISO2.MJJASO.amp1.5.Phase5',status='old')
open (16,file='../DATA/BSISO2.MJJASO.amp1.5.Phase6',status='old')
open (17,file='../DATA/BSISO2.MJJASO.amp1.5.Phase7',status='old')
open (18,file='../DATA/BSISO2.MJJASO.amp1.5.Phase8',status='old')
open (1,file='../DATA/33.Pkor.198101201012.ANOS2.daily.asc',status='old')
open (33,file='../DATA/36.Pkor.19812010.MJJASO.BSISO2.amp1.5.COMP.asc',&
&     status='unknown')


!--------- READ Pkor
    do iday=1,nday
    do iyr=nyri, nyrf
       irec=(iyr-nyri)*nday+iday
       read(1,200) (val(jj,irec),jj=1,ny)
    enddo
    enddo

year = dmiss
jday = dmiss

!--------- READ
    do ip=1,8
    do ik=1,pdate(ip)
       imun = 10+ip
       read(imun,100) year(ip,ik),jday(ip,ik)
    enddo
       close (imun)
    enddo
100 FORMAT(2x,i4.4,1x,i3.3)
200 FORMAT(89f11.5)
```

Ex:VN)

P.KR → P.VN

Ex:VN)

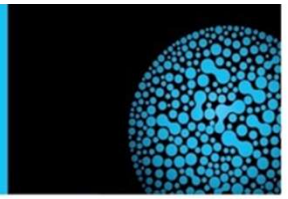
89 → 55

Drawing using GrADS

APCC APEC CLIMATE CENTER

	Input	Code	Output
5.1 Convert data format from ascii to bin	**51.station89.txt 35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc**	***05.stn.GSform.BSISO1.f90***	**52.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.dat**
5.2 Convert data format from ascii to bin	**51.station89.txt 36.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc**	***05.stn.GSform.BSISO2.f90***	**52.P.KR.MJJASO.19812010.BSISO2.COMP.gsform.dat**
6.1 Display BSISO1	52.BSISO1.stn.comp.ctl mask.KR.ctl	*06.stn.BSISO1.COMP.gs** (rgbset2.gs) (cbarn.gs)	P.KR.JJ.BSISO1.COMP.gif
6.2 Display BSISO2	52.BSISO2.stn.comp.ctl mask.KR.ctl	*06.stn.BSISO2.COMP.gs** (rgbset2.gs) (cbarn.gs)	P.KR.JJ.BSISO2.COMP.gif

Conversion [05. stn.GSform.BSISO1.f90]



```
PROGRAM read_parameter
      INTEGER, PARAMETER :: istr=1981, iend=1981, mx=89, my=1, lt= iend-istr+1, mon=8
      REAL, DIMENSION(mx) :: obs
      REAL, DIMENSION(mx) :: RLAT, RLON, STNUM
      REAL, DIMENSION(mx,mon) :: val
      CHARACTER*8 STID


!....Input data - #13 : station data(lat, lon ), #14 : variable value
      OPEN(13,file='../DATA/51.station89.txt',STATUS='OLD')
!....Output data - #21 : to GrADS, #22 : to Surfer
      OPEN(21,file='../DATA/52.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.dat',&
&             FORM='UNFORMATTED',ACCESS='STREAM', &
&             STATUS='UNKNOWN')


!....Read station data from UNIT #13
      DO istn=1,mx
         READ(13,*) ISTNUMBER, RLAT1, RLON1
         STNUM(istn) = FLOAT(ISTNUMBER)
         RLON(istn) = RLON1
         RLAT(istn) = RLAT1
      ENDDO
      CLOSE(13)

!....Read variable value from UNIT #17
open (17,file='../DATA/35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc',status='old')
```

Ex:VN)

P.KR → P.VN

89 → 55

Conversion [52.BSISO1.stn.comp.ctl]

cd ../DATA/ Enter

Vi 52.BSISO1.stn.comp.ctl Enter

```
DSET ^52.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.dat
DTYPE station
STNMAP ^53.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.map
UNDEF -999.
TITLE station data
TDEF  8     LINEAR JAN1980 1dy
VARS  1
o   0 99 observed value
ENDVARS
~
~
```

Ex:VN)

P.KR → P.VN

Conversion [52.BSISO1.stn.comp.ctl]

[tuser01@ecolog2 tuser01]$ stnmap␣–i␣52.BSISO1.stn.comp.ctl Enter

	Input	Code	Output
5.1 Convert data format from ascii to bin	51.station89.txt 35.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc	*05.stn.GSform.BSISO1.f90*	52.P.KR.MJJASO.19812010.BSISO1.COMP.gsform.dat
5.2 Convert data format from ascii to bin	51.station89.txt 36.P.KR.19812010.MJJASO.BSISO1.amp1.5.COMP.asc	*05.stn.GSform.BSISO2.f90*	52.P.KR.MJJASO.19812010.BSISO2.COMP.gsform.dat
6.1 Display BSISO1	**52.BSISO1.stn.comp.ctl** **mask.KR.ctl**	***06.stn.BSISO1.COMP.gs**** **(rgbset2.gs)** **(cbarn.gs)**	**P.KR.JJ.BSISO1.COMP.gif**
6.2 Display BSISO2	**52.BSISO2.stn.comp.ctl** **mask.KR.ctl**	***06.stn.BSISO2.COMP.gs**** **(rgbset2.gs)** **(cbarn.gs)**	**P.KR.JJ.BSISO2.COMP.gif**

Draw [06.stn.BSISO1.COMP.gs]

```
reinit'

'enable print ../DATA/P.KR.MJJASO.BSISO1.COMP.gmf'
'open ../DATA/52.BSISO1.stn.comp.ctl'
'open ../DATA/mask.KR.ctl'  → mask.MA.ctl

'set display color white'
'clear'
'./rgbset2.gs'
'set vpage off'
'set vpage 0 8.5 0 11'
'set string 17 1 3'
'set strsiz 0.15'
'draw string 0.5 10.8 BSISO1'
'set string 17 l 3'
'draw string 0.5 10.6 Precipitation Composite Anomaly'

'set lon 124.9 131.1'   87.0   115.0
'set lat 32.9 39.1'       0.0    28.0
'set xlopts 1 4 0.12'
*'set ylopts 1 4 0.12'
'set ylopts 0 0 0'
'set xlint 2'
'set ylint 1'

'set mpdset hires'
'set mproj latlon'
'set grid off'
'set z 1'
```

Ex:VN)

P.KR → P.VN

File name

Domain

Draw [06.stn.BSISO1.COMP.gs]