

```

! _____
!
! This program computes daily mean TOA solar radiation
! from Jan to Dec (last day of month) and
! 90S to 90N every 5 degrees
!
! Input:  lat          [the latitude in degrees]
!         j            [the Julian day number or day of year]
! Output: q            [the solar flux per unit surface area in
!                   Wm^-2]
!         qdaily       [daily mean value of q]
!
! Author: Liang Yang 1/31/2002
! _____

      real qdaily(12,37),doymon(12)

      data doymon /1,32,60,91,121,152,182,213,244,274,305,335/

      pi = 3.1415926
      s0 = 1367.                    !Wm^-2
      do i=1,12                      !month loop (Jan to Dec)
!
!         j = doymon(i)              !Julian day number: 1st day
!         if (i.eq.12) then
!             j = 365
!         else
!             j = doymon(i+1)-1
!         endif
!         write(6,*) i, doymon(i),j
!                                     !Julian day number: last day

!         fe = 1 + 0.033*cos(2.*pi*j/365.) !the eccentricity factor
!                                             !or the relative distance
!                                             !between Earth and Sun
!         delta = 0.4093*sin(2*pi*j/365.0 - 1.405) !the solar declination
!                                                    !in radians

!         do k=1,37                  !latitude loop (90S to 90N)

!             phi = (-90.0+(k-1)*5.)*pi/180.0 !latitude in radians
!             qtot = 0.0
!             do ih=1,24              !hour loop (1 to 24)
!                 t = ih - 0.5        !the hour of day
!                 h = pi*(t-12.0)/12.0 !the hour angle in radians
!                 q = s0*fe*(sin(phi)*sin(delta)+cos(phi)*cos(delta)*cos(h))
!                 if (q.lt.0.) q = 0. !negative means Sun is
!                                     !below horizon, set to zero
!                 qtot = qtot + q     !get daily cumulative
!             enddo
!             qdaily (i,k) = qtot / 24.0 !daily mean

!         enddo
!     enddo

!     write(11,800) (i,i=1,12)
!     write(11,900) (-90.0+(k-1)*5.,(int(qdaily(i,k)),i=1,12), k=37,1,-1)
!     write(11,800) (i,i=1,12)

```

```
800   format(8x,12I5)
900   format(2x,f4.0,2x,12I5)
      stop
      end
```