

! This program computes daily mean TOA solar radiation from Jan to Dec (mid day of month) and 90S to 90N every 5 degrees

!
! Output: qdaily [daily mean value of q]

!
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```
REAL :: qdaily(12, 37), doymon(12)
doymon=(/1, 32, 60, 91, 121, 152, 182, 213, 244, 274, 305, 335/)
pi = 3.141593
s0 = 1367.
```

```
do i=1,12 !month loop (Jan to Dec)
  if (i==12) then
    j=365
  else
    j=doymon(i)+14
  endif
  fe=1+0.033*cos(2.*pi*j/365.) !the eccentricity factor
  delta=0.4093*sin(2*pi*j/365.0-1.405) !the solar declination in radians
```

```
do k=1,37
  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<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(6,800) (i, i=1, 12)
write(6,900) (-90.0+(k-1)*5., (int(qdaily(i,k)), i=1, 12), k=37, 1, -1)
write(6,800) (i, i=1, 12)
800 format(8x, 12I5)
900 format(2x, f4.0, 2x, 12I5)
end
```