Optimización de la búsqueda de parámetros atmosféricos en modelos de transferencia radiativa

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Modelos de transferencia radiativa

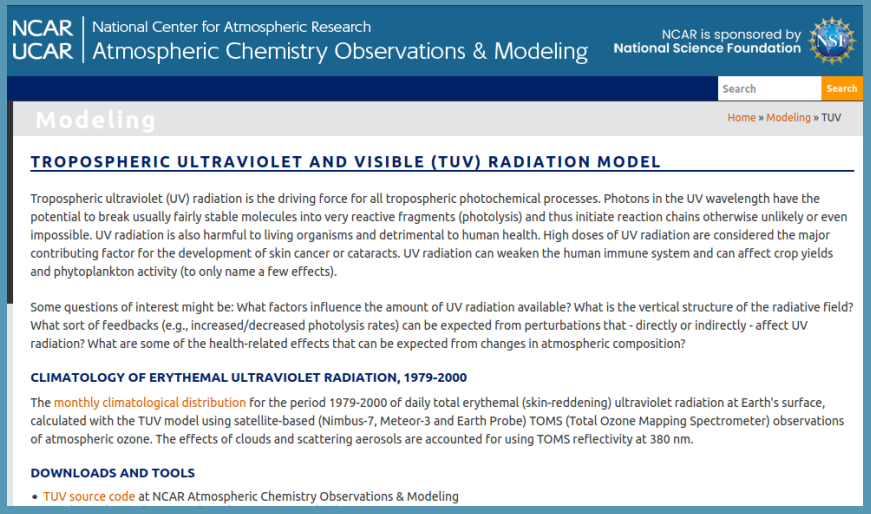


Figure 1: Tropospheric Ultraviolet and Visible (TUV) radiation model. [1]

Figure 2: Simple Model of the Atmospheric Radiative Transfer of Sunshine. [2]

¿Qué hacen estos modelos?

$$\frac{dE}{dAdt} = I_\nu(\hat{k}, \vec{r}, t)\vec{k}\cdot\vec{n}d\Omega d\nu \text{[3]}$$

```
'AOD=0.041 '
2
25.750 0.476 0
1
'USSA'
1
0
1 0.2740
0
3
390
0
'S&F_URBAN'
5
0.041 2
18
1
51 37.0 180.0
285 2800 1 1366.1
2
285 2800 1
1
4
1
0 2.9 0
0
0
1
3
2015 1 11 8.2167 25.75 -100.255 -6
```

Figure 3: Archivo de inputs del modelo SMARTS

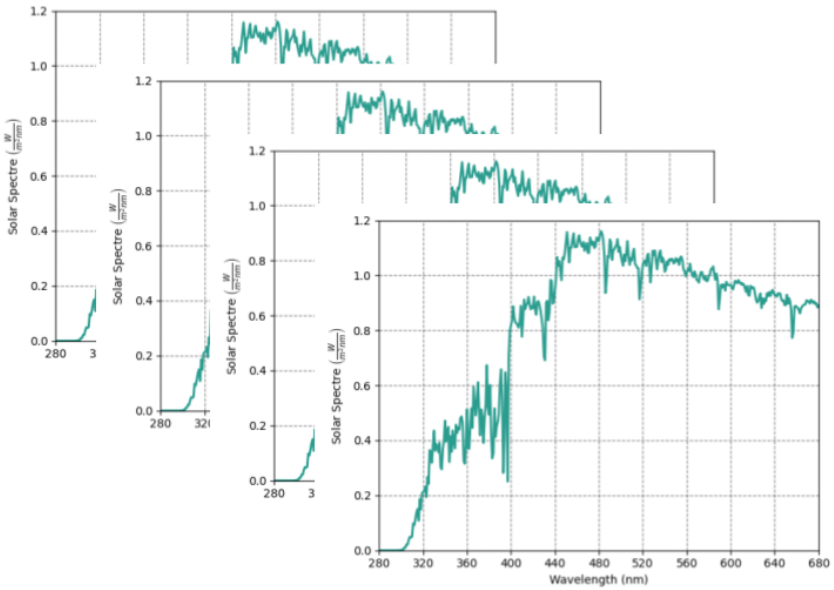
```
TUV inputs:
================================================================
inpfil =        CDMX   outfil =        cdmx   nstr =           -2
lat =         19.420   lon =         -99.145   tmzone =        -6.0
iyear =         2016   imonth =            1   iday =           9
zstart =       2.245   zstop =        80.000   nz =            81
wstart =     280.000   wstop =       400.000   nwint =         120
tstart =      10.000   tstop =        15.000   nt =            61
lzenit =           F   alsurf =        0.080   psurf =      -999.0
o3col =      228.380   so2col =       0.000   no2col =       0.100
taucld =       0.000   zbase =        4.000   ztop =         5.000
tauaer =       0.061   ssaaer =       0.800   alpha =        1.000
dirsun =       1.000   difdn =        1.000   difup =        0.000
zout =         2.245   zaird =   -9.990E+02   ztemp =     -999.000
lirrad =           T   laflux =           F   lmmech =           F
lrates =           T   isfix =            0   nms =            2
ljvals =           F   ijfix =            0   nmj =            0
iwfix =            0   itfix =            0   izfix =          0
================================================================
```

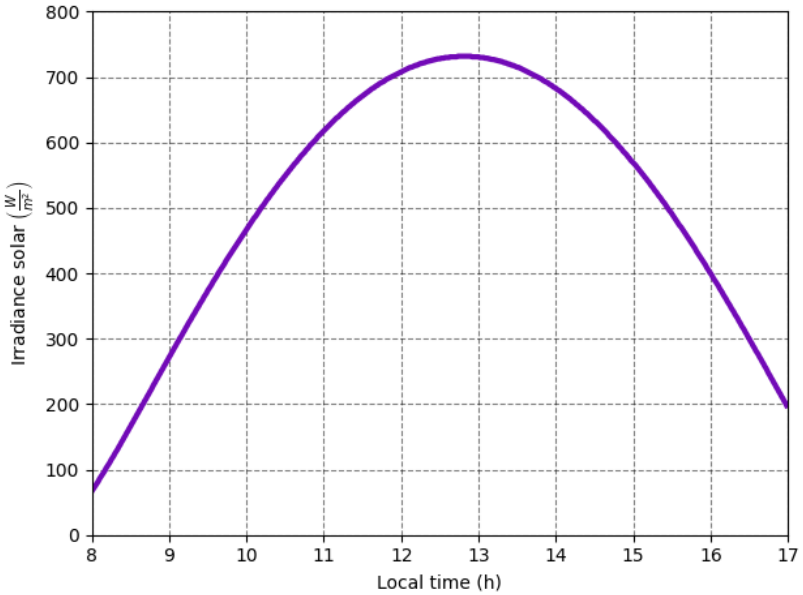
Figure 4: Archivo de inputs del modelo TUV

$$I(t) = \int_{\lambda_0}^{\lambda_i} E(\lambda, t) d\lambda \qquad (1)$$

```
# Calculo de la irradiancia solar a partir de los resultados del
modelo SMARTS
size = np.size(irradiance)
integral = irradiance[0]
for i in range(1, size):
    integral += irradiance[i]*(wavelength[i]-wavelength[i-1])
```

Figure 5: Implementación de la ecuación 1.


Solar Spectre $(\frac{W}{m^2 nm})$
Wavelength (nm)


Irradiance solar $(\frac{W}{m^2})$
Local time (h)

Mediciones in situ

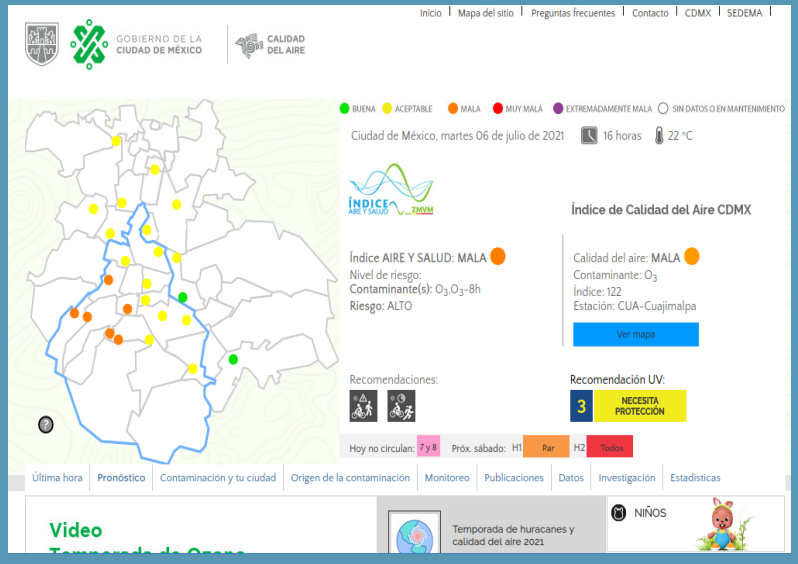


Figure 6: Página web de la SEDEMA. [4]

Figure 7: Página web del SIMA. [5]

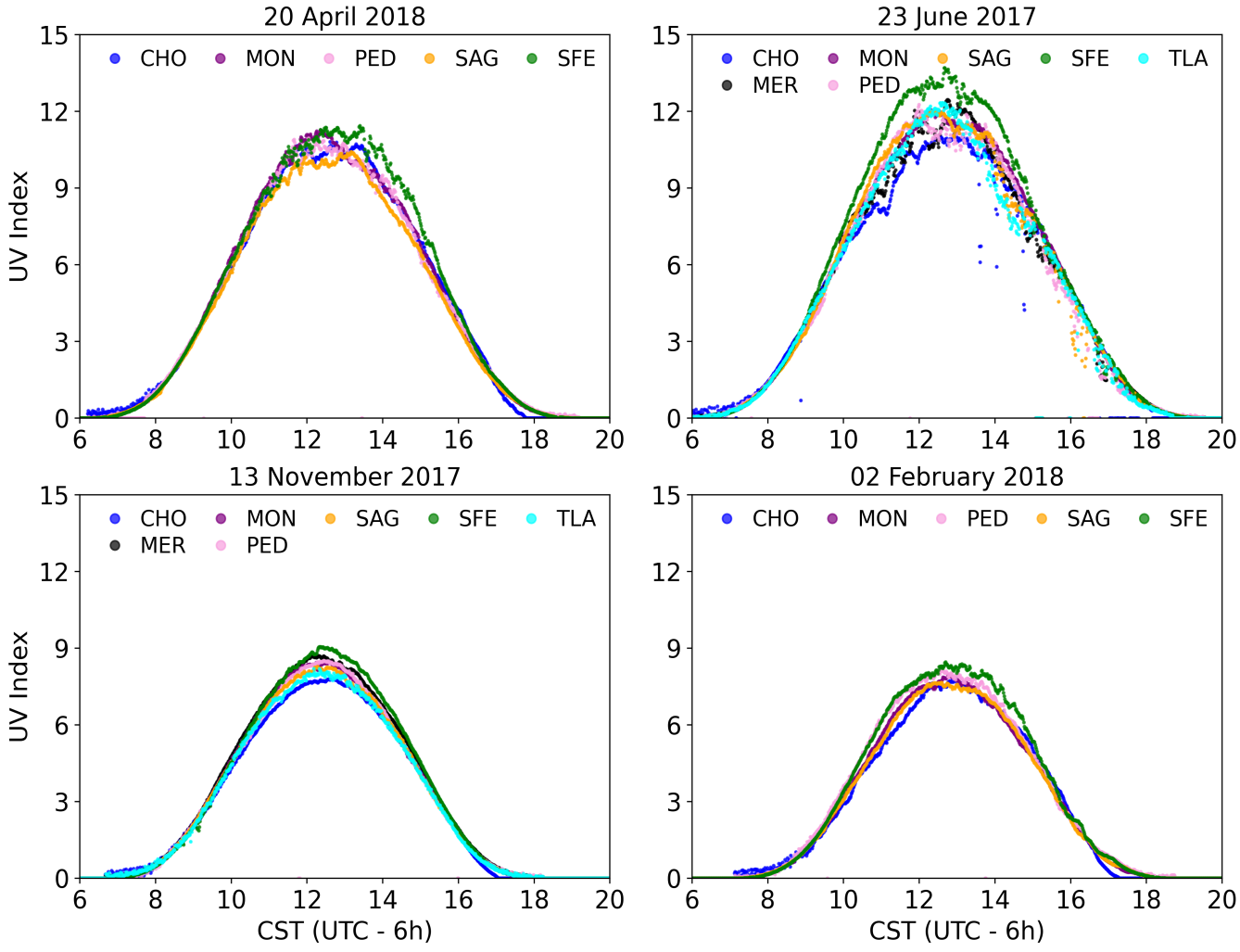


Figure 8: Mediciones de indice UV en la Ciudad de México. [4]


THANK YOU

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