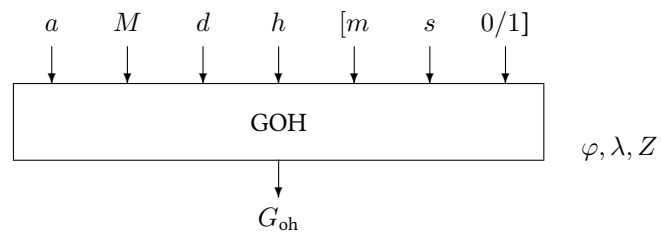


Block GOH

Warning: The explicit usage of this block is deprecated, because it uses a west-positive convention for longitudes.

Please use [GOH2](#) instead, with east-positive longitudes. GOH is still used internally by GOH2.

The GOH block returns the radiation outside atmosphere on a horizontal surface.



Name	GOH
Function	em0012
Inputs	4 ... [7]
Outputs	1
Parameters	3
Strings	0
Group	S

Inputs

- 1 Year a (for example 2001)
- 2 Month $M \in [1, 12]$
- 3 Day $d \in [1, 31]$
- 4 Hour $h \in [0, 23]$
- 5 Minute $m \in [0, 59]$
- 6 Second $s \in [0, 60)$
- 7 Daylight saving time (0 no, 1 yes)

Outputs

- 1 Radiation outside the atmosphere on a horizontal surface $G_{\text{oh}} / \text{W m}^{-2}$

Parameters

- 1 Latitude $\varphi \in [-90^\circ, +90^\circ]$, northern hemisphere positive
- 2 Longitude $\lambda \in [0^\circ, 360^\circ)$, Greenwich = 0° , west positive

3 Time zone $Z \in [0, 23]$, e. g., Central European Time: $Z = 23$

Strings

None

Description The radiation outside the atmosphere on a horizontal surface G_{oh} is given by

$$G_{\text{oh}} = \epsilon_0 G_{\text{sc}} \cos \theta_z$$

where

ϵ_0 Excentricity factor $(r_0/r)^2$, with mean distance between Sun and Earth r_0 (1.496×10^{11} m) and time dependent distance between Sun and Earth r

G_{sc} Solar constant (1367 W/m^2)

θ_z Zenith angle

The excentricity factor is calculated by Spencer's Fourier series

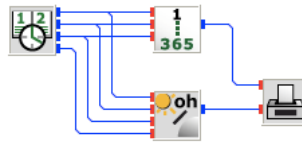
$$\begin{aligned} \epsilon_0 = & 1.00010 + 0.034221 \cos \Gamma + 0.001280 \sin \Gamma \\ & + 0.000719 \cos 2\Gamma + 0.000077 \sin 2\Gamma \end{aligned}$$

where

Γ day angle ($2\pi (\text{doy} - 1)/365$), with the day of year $\text{doy} \in [1, 365]$; leap years are not considered

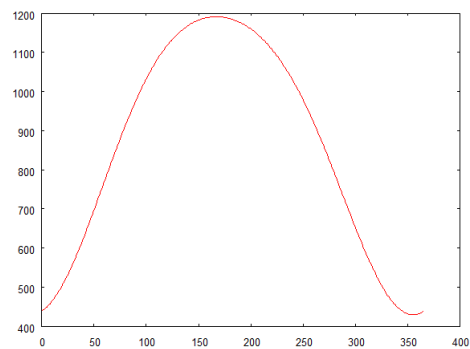
The zenith angle θ_z is calculated by an internal call to block [SUNAE](#) (using the Hollands/Maier model) and block [INANG](#) ($\beta = 0^\circ, \gamma = 180^\circ$).

goh.vseit



A **CLOCK** block delivers year, month, day, and hour data for one year in steps of one day. The hour is fixed to 12. The block **GOH** calculates the correspondig value of the extraterrestrial radiation for the location of Stuttgart, Germany. The **DOY** block converts the outputs of the **CLOCK** block to the day of the year.

The **PLOT** block plots the time series.



See also Block **GON**, block **SUNAE**.