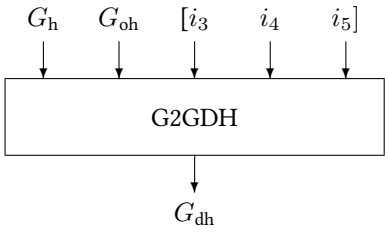
Block G2GDH

The G2GDH block returns the diffuse radiation according to various correlations for radiation hourly data.





Model

Name	G2GDH
Function	em0009
Inputs	2 . . . [5]
Outputs	1
Parameters	1
Strings	0
Group	S

Inputs

1 Global radiation G_h / W m^{-2} on a horizontal plane
2 Global radiation outside the atmosphere G_{oh} / W m^{-2} on a horizontal plane
3..5 Model dependent (see Parameters section for further details)

Outputs

1 Diffuse radiation G_{dh} / W m^{-2} on a horizontal plane

Parameters

1 Correlation
- 0 Orgill, Hollands
- 1 Erbs, Klein, Duffie
- 2 Hollands
- 3 Reindl, Beckman, Duffie
- 4 Hollands, Chra – this correlation requires the ground albedo ρ as third block input.
- 5 Skartveit, Olseth – this correlation requires the zenith angle θ_z / ° as third block input.
- 6 Reindl, Beckman, Duffie – this correlation requires the zenith angle θ_z / ° as third block input.

7 Reindl, Beckman, Duffie – this correlation requires three additional inputs: the zenith angle θ_z / ° as third block input, the ambient temperature T_a / °C as fourth input and the relative humidity as input number five.

Strings

None

Description

The block calculates the fraction of hourly diffuse and global radiation on a horizontal surface mainly on the basis of the clearness index which is defined as

$$k_t = \frac{G_h}{G_{oh}}$$

Through the setting of the first block parameter one of several correlations can be chosen.

Orgill/Hollands

The the Orgill/Hollands correlation is given by

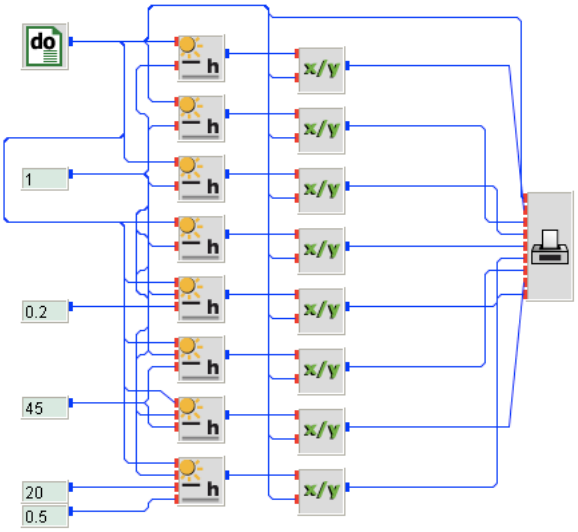
$$\frac{G_{dh}}{G_h} = \begin{cases} 1.0 - 0.249\,k_t & \text{if } 0 \le k_t \le 0.35 \\ 1.557 - 1.84\,k_t & \text{if } 0.35 < k_t \le 0.75 \\ 0.177 & \text{if } k_t > 0.75 \end{cases}$$

Erbs/Klein/ Duffie

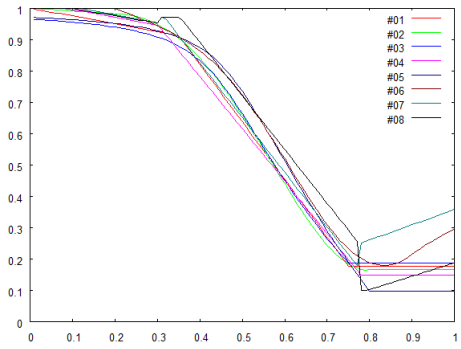
The Erbs/Klein/Duffie-Korrelation correlation is given by

$$\frac{G_{dh}}{G_h} = \begin{cases} 1.0 - 0.09\,k_t & \text{if } 0 \le k_t \le 0.22 \\ 0.9511 - 0.1604\,k_t + 4.388\,{k_t}^2 & \\ \quad -16.638\,{k_t}^3 + 12.336\,{k_t}^4 & \text{if } 0.22 < k_t \le 0.80 \\ 0.165 & \text{if } k_t > 0.80 \end{cases}$$

g2gdh.vseit



The idea of this example is exactly the same as in the example for block G2GDD only that correlations for hourly data are presented here. For further details, please refer to the example of block G2GDD.



See also Block G2GDD and G2GDM