Block GENG

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

Please use GENG2 instead, with east-positive longitudes. GENG is still used internally by GENG2.

The GENG block generates a series of hourly global radiation data from monthly mean values.



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Function	em0015
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Inputs

1	Monthly mean value $G_\mathrm{h}(M)$ / W m^{-2} of global radiation on a horizontal plane
2	Year a
3	Month $M \in [1, 12]$
4	Day $d \in [1, 31]$
5	Hour $h \in [0, 23]$
6	Minute $m \in [0, 59]$

Outputs

1	Hourly mean value $G_\mathrm{h}(h)$ / W m^{-2} of global radiation on a horizontal plane. When input six is connected, GENG performs a linear interpolation between the two corresponding hours.

Parameters

1 Latitude $\varphi \in [-90°, +90°]$, northern hemisphere positive

2 Longitude $\lambda \in [0°, 360°)$, west of Greenwich; values east of Greenwich may be used with a minus sign

3 Time zone $Z \in [0, 23]$, Greenwich Mean Time $Z = 0$, Central European Time $Z = 23$.

4 Variance factor f_σ to the Gordon / Reddy correlation, eq **??**; if unknown $f_\sigma = 1$ is recommended

5 Coefficient c_σ corresponding to the year-to-year variability due to different climatic conditions. When c_σ is set to zero the year-to-year variability is omitted. $c_\sigma = 0.185$ approximates North American variability, while $c_\sigma = 0.3$ approximates European variability

6 Autocorrelation coefficient $\rho(1)$ at a lag of one day; if unknown $\rho(1) = 0.3$ is recommended

7 Autocorrelation coefficient $\rho(2)$ at a lag of two days; if unknown $\rho(2) = 0.57\rho(1)$ is recommended

8 Initialization I_{seed} of random number generator 0 for a different random sequence at each run

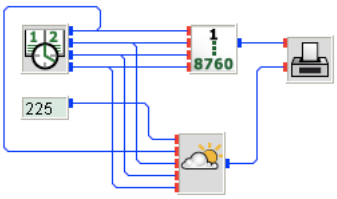
Strings

None

Remarks

The GENG block is basically a convenient combination of the GENGD block and the GENGH block.

geng.vseit



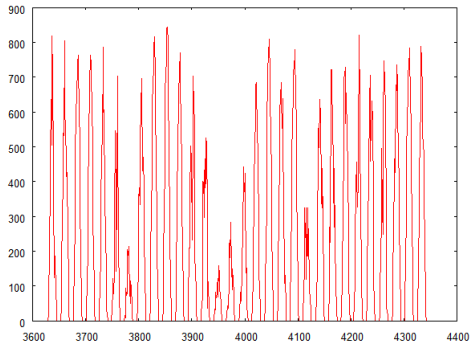
A CLOCK block simulates June 2010 in steps of one hour. The monthly mean irradiance is assumed to be 225 W/m^2 as provided by a CONST block.

In this example, the GENG block generates hourly irradiance data for the location of Stuttgart, Germany.

The Gordon-Reddy variance factor is set to one, the year-to-year variability is set to zero, such that the time series of generated irradiance data represents the monthly mean value as close as possible.

The autocorrelation coefficients are set to their defaults for European climate, i. e., 0.3 and 0.171, respectively. The random number generator is initialized by 4712.

An hour of the year block HOY is used as x-coordinate by the PLOT block which displays the generated irradiance data time series.



See also Blocks DISGR, GENGD and GENGH.