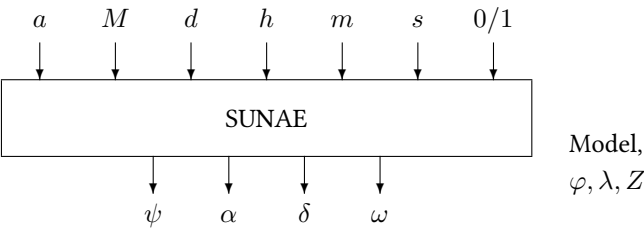


Block SUNAE

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

Please use [SUNAE2](#) instead, with east-positive longitudes. SUNAE is still used internally by SUNAE2. The SUNAE block calculates the position of the Sun in horizon and equator coordinates.



Name	SUNAE
Function	em0006
Inputs	4 ... [7]
Outputs	4
Parameters	4
Strings	0
Group	S

Inputs

- 1 Year a (for example 2010)
- 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 Azimuth ψ (north = 0° , east = 90° ... west = 270°)
- 2 Elevation $\alpha / ^\circ$
- 3 Declination $\delta / ^\circ$
- 4 Hour angle ω (0° ... 360° west)

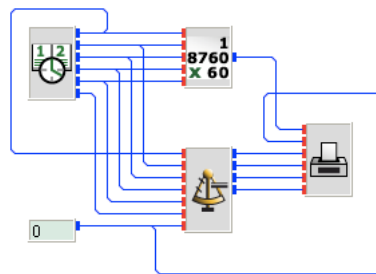
Parameters

- 1 Approximation
 - 0 Spencer
 - 1 Holland/Mayer
 - 2 Michalsky
- 2 Latitude $\varphi \in [-90^\circ, +90^\circ]$, northern hemisphere positive
- 3 Longitude $\lambda \in [0^\circ, 360^\circ)$, Greenwich = 0° , west positive
- 4 Time zone $Z \in [0, 23]$, e. g. Central European Time: $Z = 23$

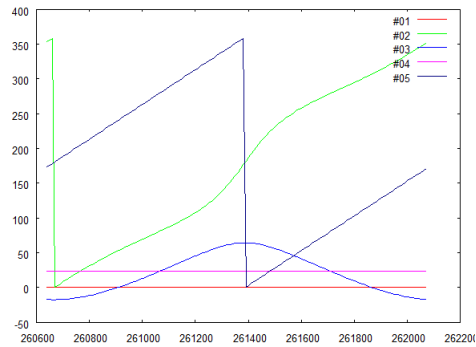
Strings

None

sunae.vseit



A **CLOCK** block varies the time of 01 July 2010 in steps of ten minutes. The **SUNAE** block calculates the position of the Sun for the location of Stuttgart, Germany. In order to provide a zero line a **CONST** block with value zero has been added. The minute-of-the-year block **MOY** provides a convenient scale for the x -axis of the **PLOT** block which displays the curves on screen.



Please notice the conventions used by INSEL:

01 Just the zero line

02 The azimuth angle is counted from 0 to 360 degrees, starting in the north with zero, clockwise positive. Consequently, when the Sun is in the South the azimuth angle is equal to 90° , independent whether the location is on the northern or the southern hemisphere.

03 The elevation. If positive, the Sun is above the horizon.

04 The declination is positive when during a day the Sun appears in the zenith in the northern hemisphere, otherwise negative.

05 The hour angle is zero for the upper culmination of the Sun. As a consequence, true solar noon corresponds to an hour angle $\omega = 0^\circ$