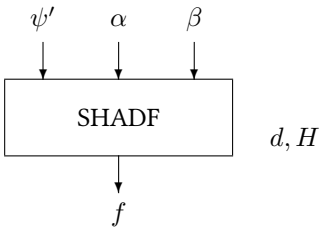
Block SHADF

The SHADF block calculates the fraction of unshaded area of rows of tilted receivers.





Name	SHADF
Function	em0031
Inputs	3
Outputs	1
Parameters	2 . . . [3]
Strings	0
Group	S

Inputs

1	Difference between surface azimuth and azimuth of the Sun ψ' / °
2	Solar elevation α / °
3	Tilt angle β / °

Outputs

1	Fraction of unshaded area f

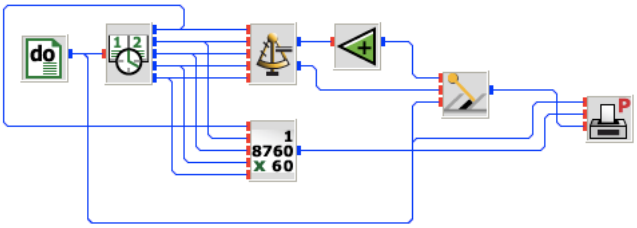
Parameters

1	Distance between module rows d / m
2	Height of modules h / m

Strings

None

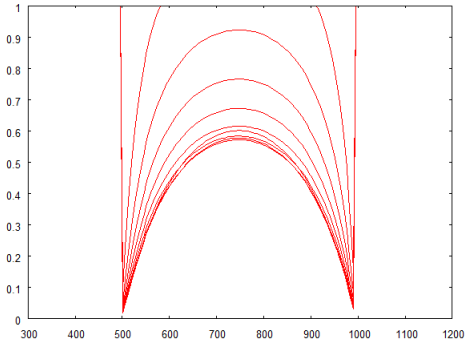
shadf.vseit



For a set of tilt angles between zero and ninety degrees as varied by a DO block in steps of ten a CLOCK block runs through the first of January 2010 from six in the morning until 7 p.m. in steps of five minutes. The SUNAE block calculates the position of the Sun for Stuttgart, Germany.

An OFFSET block with parameter -180 is used to calculate the relative surface azimuth ψ' which is required by the SHADF block. The other two inputs required by SHADF are the solar elevation and the surface tilt angle. The parameters of the SHADF block are set to a row distance of 3.65 meters at a module height of two meters.

The PLOTP block displays the unshaded fractions.



Of course, with tilt angle zero no shading occurs and the fraction of the unshaded area is constant equal to one (and not visible in the graph). With a vertical surface even at noon nearly fifty percent of the area is shaded.