

Package: solarPos (via r-universe)

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Type Package

Title Solar Position Algorithm for Solar Radiation Applications

Version 1.0

Date 2016-01-07

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Description Calculation of solar zenith and azimuth angles.

License GPL-2

NeedsCompilation no

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Repository <https://jvandinck.r-universe.dev>

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solarPos-package	<i>Solar Position Algorithm for Solar Radiation Applications</i>
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Description

Implementation of the Solar Position Algorithm for Solar Radiation Applications of Reda and Andreas (2004, 2007) for calculation of solar zenith and azimuth angles.

Details

Package: solarPos
Type: Package
Version: 1.0
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License: GPL-2

Author(s)

Jasper Van doninck

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References

Reda, I. and Andreas, A. (2004) Solar position algorithm for solar radiation applications, *Solar Energy* 76, 577-589.

Reda, I. and Andreas, A. (2007) Corrigendum to Solar position algorithm for solar radiation applications [Solar Energy 76 (2004) 577589], *Solar Energy* 81, 838.

julianDay

Julian Day

Description

Computes Julian Day from year, month, day and time of day.

Usage

```
julianDay(year, month, day, hour = 12, min = 0, sec = 0, tz = 0, dut1 = 0)
```

Arguments

year	Year
month	Month (1-12)
day	Day (1-12)
hour	Hour (0-23)
min	Minute (0-59)
sec	Second (0-59)
tz	Time zone (negative to the west)
dut1	Correction term (0-1)

Details

Astronomical year numbering is used, i.e., 0 is used for 1 BC, -1 for 2 BC, and so on.

Time is expressed as Coordinated Universal Time (UTC), or Local Standard Time (LST) if the tz argument is used. The argument dut1 is expressed as a fraction of a second and used to correct UTC to Universal Time (UT)

Value

Julian Day

Author(s)

Jasper Van doninck

Examples

```
julianDay(2000,1,1,12,0,0)
```

```
julianDay(2010,5,10,16,30,0,tz=-7)
```

```
julianDay(2015,1:12,1,0,0,0)
```

solarPosition	<i>Solar zenith and azimuth angles</i>
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Description

Computes the solar zenith and azimuth for a place on Earth for a given date and time.

Usage

```
solarPosition(jd, lon, lat, delta_t = 32.184, elev = 0, temp = 16, pres = 1013.25)
```

Arguments

jd	Julian day, with decimal fraction.
lon	Longitude, in decimal degrees.
lat	Latitude, in decimal degrees.
delta_t	Difference between the Earth rotation time and the Terrestrial Time (TT), in seconds.
elev	Elevation, in meters.
temp	Temperature, in degrees Celsius.
pres	Pressure, in hPa.

Details

Solar zenith and azimuth angle are give in degrees, azimuth is measured eastward from north.

Value

Matrix of solar zenith and azimuth angles.

Author(s)

Jasper Van doninck

Examples

```
##Julian day
```

```
jd <- julianDay(2003,10,17,12,30,30,tz=-7)
```

```
##Solar angles
```

```
solarPosition(jd,-105.1786,39.742476,delta_t=67,elev=1830.14,temp=11,pres=820)
```

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