

## 2.19 Sun Position Calculator

### 太阳位置计算器

Using the equations on the previous page, the position of the sun in the sky can be determined from the observer's location and the time of day. In the top blue squares, enter the observer's location and time of day.

通过前文给出的公式，我们可以根据观察者的位置和一天中的时刻来计算太阳在天空中的位置。在图中上部的蓝色方块中输入观察者的位置和时刻（译者注：只在原文有效）。

#### Time and Date

时刻和日期

The time is given as 24 hour time and the minutes are entered separately. Thus for 5:15 pm, enter 17 in the hour box and 15 in the minute box.

小时和分钟在不同的空格中输入，采用 24 小时制。因此，对于下午 5 点 15 分，我们需要在小时空格中输入 17，在分钟空格中输入 15。

#### Longitude, Latitude and Time Zone (GMT)

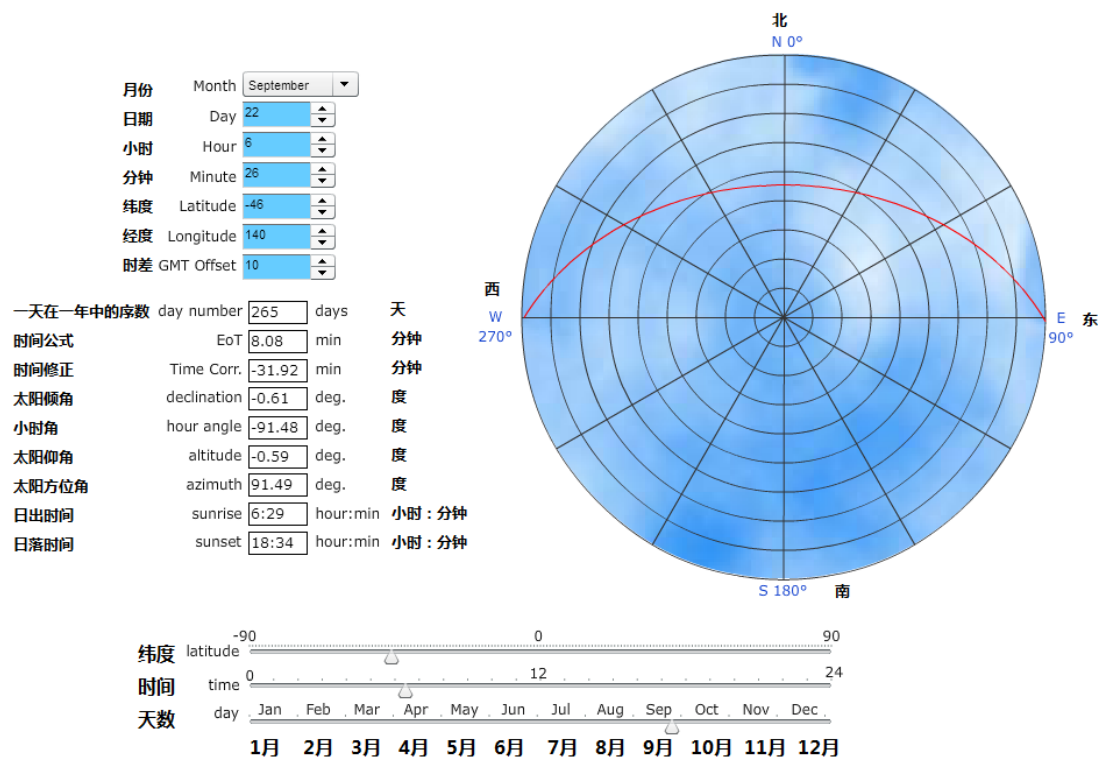
经度、纬度和时区（格林尼治标准时间）

Longitude, latitude and time zone of locations throughout the world are available at [www.timeanddate.com](http://www.timeanddate.com). Minutes of longitude and latitude are entered as fractions, so 17° 30' becomes 17.5. Enter locations with a west longitude as negative. For daylight saving (summer time), subtract 1 hour from the given values. Generally speaking, locations east of Greenwich (UK) are positive and locations west of Greenwich are negative.

[www.timeanddate.com](http://www.timeanddate.com) 网站上给出了全球所有地点的经度、纬度和时区。经纬度的“分”通过小数表示，因此 17 度 30 分就写成 17.5 度，西半球的经度为负值。在实行夏令时的地区，在给出的时间上再减去 1 小时。一般来说，格林尼治（英国）以东地区的时差（GMT Offset）为正值，以西地区的时差为负值。

There are other services that will determine your approximate latitude and longitude from your IP address. For example [ip2location.com](http://ip2location.com). For a given latitude and longitude <http://timezonedb.com/> will calculate the GMT offset.

还有一些机构可以通过你的网络协议地址给出大概的经纬度。比如，[ip2location.com](http://ip2location.com) 网站。在给定了经纬度之后，网址 <http://timezonedb.com/> 可以计算时差。



The graph on the right shows the position of the sun's azimuth and elevation angles projected onto a two-dimensional plane. An elevation angle of  $90^\circ$  corresponds to the stage when the sun is directly overhead and appears in the centre of the graph. An elevation angle of  $0^\circ$  corresponds to the point when the sun is on the horizon, and appears on the outer edge of the graph. The azimuth angles are marked around the graph's edge, so an azimuth angle of  $0^\circ$  is at the top of the graph. The graph is best understood by trying a number of times and locations and seeing where the azimuth and elevations are plotted (expand to window).

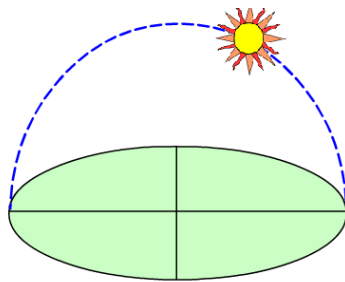
右边的图给出了太阳方位角和仰角在二维平面上的投影。 $90^\circ$  度的太阳仰角对应了太阳正好在头顶时的情况，投影出现在右图的中心位置。 $0^\circ$  度的太阳仰角对应了太阳位于地平线时的情况，投影出现在右图的边缘位置。太阳方位角标注在右图的边缘位置， $0^\circ$  度的方位角在右图的顶端。可以通过观察一些时间和位置的太阳仰角和方位角的投影来更好地理解右图。

## Explanation of polar plots

### 极坐标图的解释

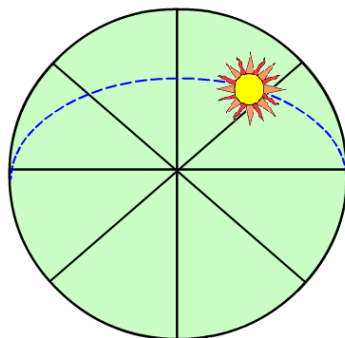
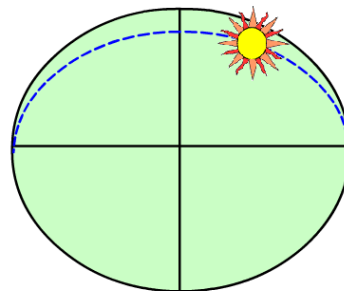
The most convenient way to plot the sun's position throughout the day is on a polar plot. Click on the animation for an explanation of these polar plots.

采用极坐标图来绘制一天中太阳位置的方法最简便。点击下面的动画（译者注：只在原文有效）来进一步了解极坐标图。



The polar plot of the sun's position involves changing the apparent perspective from that of a view standing on earth to that of a viewer lying on their back looking up.

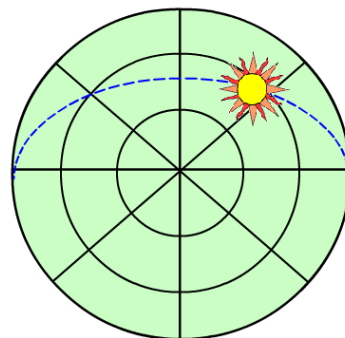
当观察者的视角从站在地上观察变为躺在地上向上观察时，我们可以得到太阳位置的极坐标图。



In the case shown here the azimuth angle is about 40°

The straight lines represent azimuth angles, assuming that when the sun is directly north the azimuth angle is 0°. When the sun is at the equator the azimuth is 90°.

图中的太阳方位角为40度。  
图中的直线表示方位角，假设当太阳在正北时，太阳方位角为0度。当太阳在赤道时，太阳方位角为90度。



In the case shown here the elevation angle is about 25°

The concentric circles represent angles, with the outermost circle corresponding to an elevation angle of 0° and the centre point representing an elevation angle of 90°

图中的太阳仰角为25度。  
图中的同心圆表示仰角，最外层的圆对应的太阳仰角为0度，中心点对应的太阳仰角为90度。

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