

Re: Online calculators for position angle

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- *From:* pausch@xxxxxxx (Paul Schlyter)
 - *Date:* Fri, 04 Nov 2005 23:44:01 GMT
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In article <436BDEAE.6010203@xxxxxxxxxxxxxx>,

Bill Owen <wmo@xxxxxxxxxxxxxx> wrote:

>canopus56 wrote:

>> Mark Gingrich wrote:

>>

>>>William Kahan['s] original solution to this very problem [of small angle

>>>angular distances, not position angle] -- a solution he claims is both

>>>accurate for *any* angular separation and efficient:

>>> <http://www.cs.berkeley.edu/~wkahan/Math128/angle.pdf>

>>

>>

>> That's an interesting implementation -- convert the two positions to the

>> X,Y,Z coordinates on a unity sphere and then use the 3-D Pythagorean

>> formula. Meeus's small angular distance formula is basically the

>> same, except he uses the 2-D Pythagorean formula.

>

>Cartesian coordinates are definitely the way to go, especially when you

>then use rotation matrices to transform between coordinate systems.

>Just figure out the sequence of rotations you need in order to put the z

>axis along your pole of interest (it's the primary star for the position

>angle and separation problem we've been discussing), and then you can

>use $\text{asin}(z)$ [or, better, $\text{atan2}(z, \sqrt{x^2+y^2})$] to get the latitude

>kind of angle and $\text{atan2}(y,x)$ to get the longitude kind of angle. Or,

> $\text{acos}(z)$ to get the polar angle.

>

>Incidentally, the "standard American" way of measuring azimuth CCW from

>north implies a *left-handed* coordinate system, with x north, y EAST,

>and z up.

I don't thin that standard is US specific -- don't most countries use that standard?

Anyway, if you instead put x east, y north, and z up, you'll get a normally oriented right-handed coordinate system. And that's an argument to favour east positive longitudes rather than the older astronomical standard of west positive longitudes.

>-- Bill

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• **References:**

- ◆ ***Re: Online calculators for position angle***
◇ *From:* Mark Gingrich
- ◆ ***Re: Online calculators for position angle***
◇ *From:* canopus56
- ◆ ***Re: Online calculators for position angle***
◇ *From:* Bill Owen

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