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Subject: Re: Local solar time

Posted by [Craig Markwardt](#) on Tue, 29 Jun 2004 19:13:53 GMT

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James Kuyper <kuyper@saicmodis.com> writes:

>

> I know of at least two different things that are referred to as Julian  
> days. The first of these is indeed a time system; it is a single number  
> for every single day, starting at Jan. 1, 4713 B.C.E. at 12:00:00, a  
> time when three different cycles associated with three ancient calendar  
> systems were all synchronized. Nobody was using any of those three

James, as a mini-tutorial on julian day numbers, your post was great.

However, I will take issue on your claim that Julian days is a "time system." In fact, Julian day numbers are simply a means of counting whole and fractional days, referred to some offset, but it is the definition of those days that are important!

For example, we could define a day as

number of solar meridian crossings + (local solar time)/(24 hr) [LAST]

or

number of solar meridian crossings + (Greenwich solar time)/(24 hr) [GAST]

Both have meaning, and both are Julian day numbers, but one is a local solar time, one is a the Greenwich solar time. [and both will have irregular lengths]

But why stop there? "Day" could be mean solar days. UT1 is close to this, with the exception of leap seconds, and the fact that the length of day varies.

"Day" could also be 86400 seconds, as defined by atomic clock standards [TAI], in which case every day is a fixed length. In fact there are systems where the clock is placed at different locations (barycenter time, TDB), or even ticks at slightly different rates (coordinate times TCG, TCB).

So, in addition to saying "Julian days," which provides the unit of time we also need to specify the time system in use, such as UTC, TAI, solar time [local vs. Greenwich], etc.

Why is this important? The original poster did not specify which system he was converting from, so there was some ambiguity at the time of what conversions would need to be done.

Craig

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