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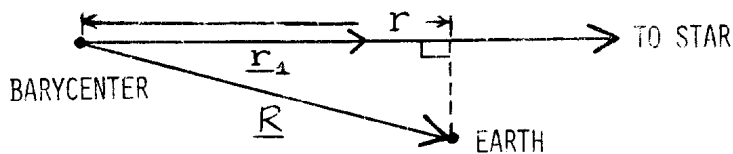
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ADOPTION OF THE BARYCENTER OF THE SOLAR SYSTEM AS THE
 REFERENCE POINT FOR THE TIMING OF VARIABLE STAR OBSER-
 VATIONS.

A number of considerations lead to a strong recommendation that observers of variable stars express times in Barycentric Times:

1. The advent of radio time signals giving Coordinated Universal Time, and the use of microcomputers for timekeeping, makes it possible to determine current Terrestrial Dynamic Time (TDT) with considerable precision.
 2. Heliocentric times referred to the center of the Sun are subject to a periodic component caused by the motion of the Sun around the Barycenter. The principal term has a period of about 12 years (Jupiter) and causes a variation of about ± 0.00004 day.
- The recent changes in the format of the Astronomical Almanac and the development of the Floppy Almanac permit convenient calculation of the Barycentric Equatorial Rectangular Coordinates of the Earth, J2000, for any TDT.

An algorithm for determining the light time correction to the TDT of an observation follows:



\underline{r}_1 = unit vector in the direction of a star.

\underline{R} = radius vector from the Barycenter to the center of the Earth.

$$r = \underline{R} \cdot \underline{r}_1 = R \cos(\underline{R}, \underline{r}_1) \\ = X \cos \delta \cos \alpha + Y \cos \delta \sin \alpha + Z \sin \delta$$

Light Time Correction = $r \times 499.004782$ seconds.

X,Y,Z = Barycentric equatorial rectangular coordinates
of the Earth, J2000, for time TDB (differs
from TDT by no more than 2 milliseconds).
 α, δ = Mean Right Ascension and Declination of the
star, Epoch J2000.
499.004782 = I.A.U. primary constant; light time for a unit
distance in the Solar System.

The light time correction is added algebraically to TDT to
get Barycentric Time. The maximum monthly variation of this
correction, caused by the motion of the center of the Earth
around the center of mass of the Earth-Moon system, is about
+/- 15 milliseconds. The maximum possible daily variation,
caused by the rotation of the Earth, is about 21 milli-
seconds.

If adopted, this convention should remove the principal
timing error caused by the observer's motion and eventually
increase the accuracy of period variation studies with a
long time base.

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Editors' note: Dr. P. Ahnert (Sonneberg Observatory , G.D.R.) published
a Table in "Mittellungen über Veränderlichen Sterne , Suppl. 1. (1961)"
for the barycentric light time corrections for the years 1850 - 2051 taking
into account the effect of the five outer planets.