

The time shift between Mars and Earth, the calculus equation of time

The time shift between two synchronized watches is related to the distance from the Sun of the planets Mars and Earth. The Sun is the principal generator of Tau neutrinos; thus, the time in our neighborhood.

For the time flow Flux Tau neutrino, we have the second order (wave equation) $\frac{\partial^2 P(r,t)}{c^2 \partial t^2} - \frac{\partial^2 P(r,t)}{\partial r^2} = 0$ (1)

With initial condition $P(R,t)=0$ normalization, and the cosmological integral $\int P(0,t) dt = 2.918\text{Gly}$
(16.4Gly-13,79Gly+0.29Gly=2.918Gly with spherical cords symmetry).

(2)

$$P(r,t) = 1.06577 \times 10^{-57} (r^2 + c^2 t^2) - 6.16318 \times 10^{-33} r + +4.69180 \times 10^{-18}$$

Time flow ~ flux/ surface unit $P(r,t) / 4\pi r^2$

And for $t_0 = 0$, the flux is proportional to: $P(r,0) = 1.06577 \times 10^{-57} (r - r_0)(r - R)$,

$$r_0 = 11222.35 \text{ m}, \quad R = 3.9228 \times 10^{22} \text{ m}$$

Where r_0 is $\approx 3.8 \cdot R_{\text{Schwarzschild}}$ of the Sun, the trashold for a Black Hole (11225.6 m)

The perception of time on Mars is slower than on Earth, and considering the initial value of time $t = 0$ and the pas slower on the Mars.

According to <http://www.michaelvio.byethost8.com/Tau.pdf> =>

With a solution for null flux $t_0 = 11222.4 \text{ m}$, thus the temporal event horizon is at 11.223Km.

Link PDF format, and <http://www.michaelvio.byethost8.com/Tau.pdf>

Thus, each day on Mars, time loses ~ 15 milliseconds, and time is slow on Mars, depending on the distance to the Sun (249 million km or 206 million km). The time shift is detectable with an atomic watch. The flux increment relative to the Local Universe with r in meters distance to the Sun.

Thus, each second on Mars time loses, and time is slow due to the Tau neutrino, depending on the distance to the Sun (249 million km or 206 million km).

Still, the gravitational relativistic effect is weaker on Mars, and the total effect is 477 μs per Earth Day.

<https://www.universetoday.com/articles/do-you-know-what-time-it-is-if-youre-on-mars-now-you-do>

The time shift is detectable with an atomic watch. The flux increments relative to the Milky Way with r in meters distance to the Sun.

But also, the Earth has a variable distance to the Sun between 147 and 152 million km. Surprisingly, the GPS satellite is 20000km in the sky between the two positions in front of the Sun on the day and the night towards the Sun $[2 \cdot (6371+20000)\text{Km}] \Rightarrow \approx 0.3 \mu\text{s/hr}$. <http://www.michaelvio.byethost8.com/MarsGeo.pdf>

For geostationary satellites, $[2 \cdot (6371+35800)\text{Km}]$, the drift in time flow per hour is $\approx 2,13 \mu\text{s/hr}$ or $\approx 51 \mu\text{s/day}$ due to gravity and $(+ 0 \div 0.5 \mu\text{s/hr Sun-facing} \ \& \ - 0 \div 0.5 \mu\text{s/hr anti-Sun}) \pm 6 \mu\text{s per } \frac{1}{2} \text{ day}$ due to tau neutrino <http://www.michaelvio.byethost8.com/MarsEAI.pdf>

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