3(1): Precession of the Planet Mercury.

. In general, the precession of any object of mass m around a [...]ing mass M can be deduced to be:

$$\Delta\phi = \frac{r^2}{2}\left(\frac{\omega}{r} - \frac{\partial\omega}{\partial r}\right) \quad -(1)$$

[...]g the apsidal method in the near circular approximation. Here [...]is the magnitude of the vector spin connection $\underline{\omega}$. Eq. (1) can [be] expressed as the differential equation:

$$\frac{\partial\omega}{\partial r} = \frac{\omega}{r} - \frac{2\Delta\phi}{r^2} \quad -(2)$$

[...]ich has the solution:

$$\omega(r) = \frac{\Delta\phi}{r} + C_1 r \quad -(3)$$

[...]ccording to the online Wolfram package. Here C_1 is the constant [of] integration. This solution can be checked with Maxima. If [i]t is assumed that:

$$C_1 = 0 \quad -(4)$$

[th]en

$$\omega(r) = \frac{\Delta\phi}{r} \quad -(5)$$

and

$$\boxed{\Delta\phi = r\omega(r)} \quad -(6)$$

So any precession is due to the spin connection $\omega(r)$. In general:

$$\underline{F} = -m\underline{\nabla}\phi_0 + m\underline{\omega}\phi_0 \quad -(7)$$

where ϕ_0 is the gravitational potential:

$$\phi_0 = -\frac{MG}{r} \quad -(8)$$

From previous work:

$$\omega = \frac{2}{3}\frac{\langle \delta r \cdot \delta \underline{r}\rangle}{r^3} \quad -(9)$$

So the total orbital precession is always expressible

$$\boxed{\Delta\phi = \frac{2}{3}\frac{\langle \delta \underline{r} \cdot \delta \underline{r} \rangle}{r^2}} \quad -(10)$$

a nearly circular orbit.

Consider the precession of the planet Mercury about sun. According to Marion and Thornton, the experimentally served precession is

$$\Delta\phi = 43.11'' \text{ per earth century} \quad -(11)$$
$$= 0.4311'' \text{ per earth year}$$

Use:

$$1'' = 4.84814 \times 10^{-6} \text{ radians} \quad -(12)$$

then

$$\Delta\phi = 2.09 \times 10^{-7} \text{ radians a year.}$$

It is claimed in the standard model that this result is due entirely to Einstein's theory of general relativity, which produces:

$$\Delta\phi_E = \frac{6\pi MG}{c^2 a(1-\epsilon^2)} \quad -(13)$$

per revolution of 2π.

For Mercury:

$$a = 5.7909 \times 10^{10} \text{ m} \quad -(14)$$
$$\epsilon = 0.20563 \quad -(15)$$

from eq. (13):

$$\Delta\phi_E = 0.1033'' \text{ per } 2\pi \text{ revolution} \quad -(16)$$

This revolution of 2π is the Mercury year of 88 ... so:

$$\Delta \phi_E = \frac{365}{88} \times 0.1033''$$

$$= 0.4285'' \text{ per earth year} \quad -(17)$$

$$= 42.85'' \text{ per earth century.}$$

So $$\Delta \phi_E = 2.08 \times 10^{-6} \text{ radians per earth year.} \quad -(18)$$

It is claimed that contemporary measurements make this agreement more and more precise. It is now accepted that this claim cannot be true, because the Einstein theory is riddled with errors

This note shows that the claim can be dismissed on the grounds that it entirely omits consideration of the other precessions present: Thomas precession, Lense Thirring precession and geodetic precession.

Thomas Precession

This is $$\Delta \phi_T = 2\pi \left(\left(1 - \frac{v^2}{c^2} \right)^{-1/2} - 1 \right) \quad -(19)$$

where v is the rotational velocity of the infinitesimal line element. The orbit of Mercury is roughly circular, so v is the orbital velocity of Mercury:

$$v = 4.76 \times 10^4 \text{ m s}^{-1} \quad -(20)$$

It is seen that

$$v << c \quad -(21)$$

so

$$\Delta \phi_T = \sim \pi \left(\frac{v}{c} \right)^2 = 7.92 \times 10^{-8}$$

$$\text{radians per } 2\pi \text{ revolution} \quad -(22)$$

This 2π revolution refers to the Mercury year of 88 days. For an Earth year of 365 days:

4)

$$\Delta\phi_T = \frac{365}{88} \times 7.92 \times 10^{-8} \quad -(23)$$

$$= 3.285 \times 10^{-7} \text{ radians per earth year.}$$

Therefore:

$$\Delta\phi_E + \Delta\phi_T = 2.4085 \times 10^{-6} \text{ rad per earth year} \quad -(24)$$

The experimental claim is:

$$\Delta\phi(\text{exp}) = 2.09 \times 10^{-6} \text{ radians per earth year} \quad -(25)$$

The theoretical result is already much larger than the experimental result, there is no "precise agreement"

Geodetic Precession

In order to demonstrate the complete failure of the standard model use the latter's own method of calculating the geodetic precession, given in Note 405(3). The result is eq. (25) of Note 405(3).

$$\Delta\phi_g = 2\pi\left(\left(1 - \frac{v_1^2}{c^2}\right)^{-1/2} - 1\right) \quad -(26)$$

$$\sim \pi\left(\frac{v_1}{c}\right)^2$$

where

$$v_1^2 = v^2 + \frac{2MG}{r} \quad -(27)$$

For a roughly circular orbit, the orbital velocity is:

$$v^2 = \frac{MG}{r} \quad -(28)$$

in the Newtonian theory.

So

$$v_1^2 = 3v^2 \quad -(29)$$

5) and $\Delta \phi_g \sim 9 \Delta \phi_T$ — (30)

— (31)

i.e. $\Delta \phi_g = 2.96 \times 10^{-6}$ radians per earth year

This result alone is much larger than the experimental claim of

$$\Delta \phi (\text{exp}) = 2.09 \times 10^{-6} \text{ radians per earth year} \quad -(32)$$

The sum of the obsolete and clearly incorrect standard model results is:

$$\Delta \phi = \Delta \phi_E + \Delta \phi_g \quad -(33)$$

$$= 5.05 \times 10^{-6} \text{ radians per earth year}$$

This is already more than double the claimed experimental result. Note that the Thomas precession is included already in the geodetic precession.

Lense Thirring Precession of Mercury

This is completely ignored in the standard model, and the geodetic precession of Mercury is also completely ignored. Following UFT 344, the gravitomagnetic field of the spinning sun is:

$$\underline{\Omega} = \frac{G}{2c^2 r^3} \left(\underline{L} - 3 \underline{L} \cdot \frac{\underline{r}\,\underline{r}}{r^2} \right) \quad -(34)$$

and the Lense Thirring precession is the Larmor precession:

$$\Delta \phi_{LT} = \frac{1}{2} | \underline{\Omega} | \quad -(35)$$

The spin angular momentum of the sun is:

$$\underline{L} = \frac{2}{5} M R^2 \underline{\omega} \quad -(36)$$

Here r is the mean distance of Mercury from the sun:

$$r = 5.791 \times 10^{10} \text{ m}, \quad -(37)$$

R is the mean radius of the sun:

$$R = 6.957 \times 10^{8} \text{ m} \quad -(38)$$

As argued in 4FT344:

$$\Omega \sim \frac{GL}{2c^2 r^3} \quad -(39)$$

to a good approximation. The units of Ω are radians per second. So:

$$\Omega = \frac{1}{5} \frac{mR^2 G}{c^2 r^3} \omega$$

$$= \frac{1}{5} \frac{mG}{c^2} \frac{R^2}{r^3} \omega \quad -(40)$$

and

$$\Delta \phi_{LT} = \frac{\Omega}{2} = \frac{1}{10} \frac{mG}{c^2} \frac{R^2}{r^3} \omega \quad -(41)$$

Here:

$$\frac{1}{10} \frac{mG}{c^2} = 147.5 \text{ m} \quad -(42)$$

and

$$\frac{R^2}{r^3} = \frac{6.957^2 \times 10^{16}}{5.791^3 \times 10^{30}} \text{ m}^{-1}$$

$$= \frac{48.40}{194.21} \times 10^{-14}$$

$$= 2.49 \times 10^{-15} \text{ m}^{-1} \quad -(43)$$

So

$$\Delta \phi_{LT} = 3.67 \times 10^{-13} \omega \quad -(44)$$

in radians per second.

The angular velocity of the sun used in 4FT344 is

$$\omega = \frac{2\pi}{T} \quad -(45)$$

where T is the time taken for the sun to complete

7) one rotation about its axis - 27 days. Therefore in 27 days:

$$\Delta \phi_{LT} = \frac{2\pi}{T} \times 3.67 \times 10^{-13} \text{ radians} \quad -(46)$$

In one earth year of 365 days:

$$\Delta \phi_{LT} = 2\pi \times \frac{365}{27} \times 3.67 \times 10^{-13} \quad -(47)$$

$$= 3.12 \times 10^{-11} \text{ radians per earth year.}$$

The total precession from the standard model is theory is:

$$\Delta \phi = \Delta \phi_E + \Delta \phi_g + \Delta \phi_{LT} \quad -(48)$$

$$= 5.05 \times 10^{-6} \text{ radians per earth year.}$$

This is more than twice the claimed experimental result

$$\Delta \phi(\text{obs}) = 2.09 \times 10^{-6} \text{ radians per earth year} \quad -(49)$$

The standard model is nonsense and is replaced by the ECE2 interpretation:

$$\Delta \phi(\text{obs}) = \frac{2}{3} \frac{\langle \delta \underline{r} \cdot \delta \underline{r} \rangle}{r^2} \quad -(50)$$

so:

$$\langle \delta \underline{r} \cdot \delta \underline{r} \rangle = \frac{3}{2} r^2 \Delta \phi(\text{obs})$$

$$= \frac{3}{2} \times 5.791^2 \times 10^{20} \times 2.09 \times 10^{-6} \quad -(51)$$

$$= 3.135 \times 10^{-6} r^2$$

or

$$\boxed{\frac{\langle \delta \underline{r} \cdot \delta \underline{r} \rangle}{r^2} = 3.135 \times 10^{-6}} \quad -(52)$$

) The observed precession of mercury is due to vacuum fluctuations represented by the isotropic average $\langle \underline{\delta r} \cdot \underline{\delta r} \rangle$.

Table of Some Precessions of Mercury
(in radians per earth year)

Precession	Result
observed	2.09×10^{-6}
Einsteinian	2.08×10^{-6}
Geodetic	2.96×10^{-6}
Lense Thirring	3.12×10^{-11}
Thomas*	3.29×10^{-7}

* The Thomas precession is part of the geodetic precession.

Refutation of EGR for the Earth

The claimed experimental result is given in Table 7.2 of Marion and Thornton, 3rd edition:

$$\Delta\phi(\text{earth}) = 5.0 \pm 1.2'' \text{ per century} \quad -(53)$$

$= 2.424 \times 10^{-7}$ ——— radians per earth year

The Einsteinian result is:

$$\Delta\phi = \frac{6\pi MG}{c^2 a(1-\epsilon^2)} \quad -(54)$$

where

$$\left.\begin{aligned} \frac{2MG}{c^2} &= 1.475 \times 10^3 \text{ m} ; \\ a &= 1.495 \times 10^{11} \text{ m} \end{aligned}\right\} \quad -(55)$$

$$\epsilon = 0.0167 \quad -(56)$$

so

$$\Delta\phi_E = 9.30 \times 10^{-8} \text{ radians per earth year}$$

$$\Delta\phi(\text{obs}) = 2.42 \times 10^{-7} \quad " \quad " \quad "$$

Obviously, the agreement is not precise. There is confidence in the Einstein theory.