201(4): Refutation of General Relativity in All Spherical Spacetimes

The method of general relativity in a spherical spacetime all rest on the infinitesimal line element:

$$ds^2 = c^2 d\tau^2 = m(r,t)c^2 dt^2 - n(r,t)dr^2 - r^2 d\theta^2 \quad -(1)$$

in the plane:

$$d\tau^2 = 0. \quad -(2)$$

By definition:

$$c^2 d\tau^2 = m(r,t)c^2 dt^2 - d\underline{r} \cdot d\underline{r} \quad -(3)$$

where:

$$d\underline{r} \cdot d\underline{r} = v^2 dt^2 = n(r,t)dr^2 + r^2 d\theta^2 \quad -(4)$$

so

$$v^2 = n(r,t)\left(\frac{dr}{dt}\right)^2 + r^2\left(\frac{d\theta}{dt}\right)^2. \quad -(5)$$

The standard method uses the lagrangian:

$$\mathcal{L} = \frac{1}{2}mc^2 = \frac{1}{2}m\,m(r,t)c^2\left(\frac{dt}{d\tau}\right)^2 - \frac{1}{2}m\,n(r,t)\left(\frac{dr}{d\tau}\right)^2 - \frac{1}{2}mr^2\left(\frac{d\theta}{d\tau}\right)^2. \quad -(6)$$

The Euler Lagrange equation gives the total energy E, and the total angular momentum L:

$$E = m(r,t)mc^2\frac{dt}{d\tau} \quad -(7)$$

$$L = mr^2\frac{d\theta}{d\tau} \quad -(8)$$

where

$$\frac{dt}{d\tau} = \left(m(r) - \frac{v^2}{c^2}\right)^{-1/2}, \quad -(9)$$

$$\frac{d\theta}{d\tau} = \frac{d\theta}{dt}\frac{dt}{d\tau} = \omega\frac{dt}{d\tau} \quad -(10)$$

Therefore:

$$\omega = \frac{d\theta}{dt} = \frac{cbn(r)}{r^2} \quad -(11)$$

where

$$b = \frac{Lc}{E}. \quad -(12)$$

From eq. (1):

$$mc^2 = mn(r,t)c^2\left(\frac{dt}{d\tau}\right)^2 - mn(r,t)\left(\frac{dr}{d\tau}\right)^2 - mr^2\left(\frac{d\theta}{d\tau}\right)^2 \quad -(13)$$

$$= \frac{E^2}{n(r,t)mc^2} - mn(r,t)\left(\frac{dr}{d\tau}\right)^2 - \frac{L^2}{mr^2}. \quad -(14)$$

Therefore:

$$mn(r,t)\left(\frac{dr}{d\tau}\right)^2 = \frac{E^2}{n(r,t)mc^2} - mc^2 - \frac{L^2}{mr^2}. \quad -(15)$$

In this equation:

$$\frac{dr}{d\tau} = \frac{dr}{d\theta}\frac{d\theta}{d\tau} = \frac{L}{mr^2}\frac{dr}{d\theta}. \quad -(16)$$

So:

$$\frac{mn(r,t)L^2}{m^2r^4}\left(\frac{dr}{d\theta}\right)^2 = \frac{E^2}{n(r,t)mc^2} - mc^2 - \frac{L^2}{mr^2} \quad -(17)$$

$$\left(\frac{dr}{d\theta}\right)^2 = \frac{mr^4}{n(r,t)L^2}\left(\frac{E^2}{n(r,t)mc^2} - mc^2 - \frac{L^2}{mr^2}\right) \quad -(18)$$

$$= \frac{r^4}{n(r,t)n(r,t)}\frac{E^2}{L^2c^2} - \frac{m^2c^2r^4}{n(r,t)L^2} - \frac{r^2}{n(r,t)}$$

$$= \frac{r^4}{n(r,t)}\left(\frac{1}{n(r,t)b^2} - \left(\frac{1}{a^2} + \frac{1}{r^2}\right)\right)$$

where $a = \dfrac{L}{mc}$, $b = \dfrac{Lc}{E}$ $\quad -(19)$

The orbital equation is: $\quad -(20)$

$$\boxed{\left(\frac{dr}{d\theta}\right)^2 = \frac{r^4}{n(r,t)}\left(\frac{1}{m(r,t)b^2} - \left(\frac{1}{a^2} + \frac{1}{r^2}\right)\right)}$$

Now use:

$$\left(\frac{dr}{dt}\right)^2 = \omega^2\left(\frac{dr}{d\theta}\right)^2 = \frac{c^2 b^2 m^2(r,t)}{r^4}\left(\frac{dr}{d\theta}\right)^2 \quad -(21)$$

$$= \frac{c^2 b^2 m^2(r,t)}{n(r,t)}\left[\frac{1}{m(r,t)b^2} - \left(\frac{1}{a^2} + \frac{1}{r^2}\right)\right]$$

$$= c^2\left[\frac{m(r,t)}{n(r,t)} - b^2\frac{m^2(r,t)}{n(r,t)}\left(\frac{1}{a^2} + \frac{1}{r^2}\right)\right].$$

$-(22)$

Therefore:

$$\left(\frac{dr}{dt}\right)^2 = c^2\frac{m(r,t)}{n(r,t)}\left(1 - b^2 m(r,t)\left(\frac{1}{a^2} + \frac{1}{r^2}\right)\right)$$

$-(23)$

From eq. (5):

$$v^2 = c^2 m(r,t)\left(1 - b^2 m(r,t)\left(\frac{1}{a^2} + \frac{1}{r^2}\right)\right) + \left(\frac{c\,b\,m(r)}{r}\right)^2 \quad -(24)$$

4) This result is not given in UFT 194 and Proof 6.

Therefore:

$$v^2 = c^2 n(r,t)\left(1 - \left(\frac{mc^2}{E}\right)^2 n(r,t)\right) \quad -(25)$$

From eqs. (7), (8) and (9):

$$n(r,t) = \frac{1}{2}\left(\frac{E}{mc^2}\right)\left(1 \pm \left(1 - 4\frac{v^2}{c^2}\left(\frac{mc^2}{E}\right)^2\right)^{1/2}\right) \quad -(26)$$

Eliminate v^2 between eqs. (25) and (26) to give:

$$n(r,t) - \frac{1}{2}\left(\frac{E}{mc^2}\right) = \pm \frac{1}{2}\left(\frac{E}{mc^2}\right)\left(1 - 4\frac{v^2}{c^2}\left(\frac{mc^2}{E}\right)^2\right)^{1/2} \quad -(27)$$

Square both sides:

$$\left(n(r,t) - \frac{1}{2}\left(\frac{E}{mc^2}\right)\right)^2 = \frac{1}{4}\left(\frac{E}{mc^2}\right)^2\left(1 - 4\frac{v^2}{c^2}\left(\frac{mc^2}{E}\right)^2\right)$$

$$= \frac{1}{4}\left(\frac{E}{mc^2}\right)^2 - \frac{v^2}{c^2}$$

$$= \frac{1}{4}\left(\frac{E}{mc^2}\right)^2 - n(r)\left(1 - \left(\frac{mc^2}{E}\right)^2 n(r)\right)$$

$$= n^2(r,t) - \left(\frac{E}{mc^2}\right) n(r,t) + \frac{1}{4}\left(\frac{E}{mc^2}\right)^2 \quad -(28)$$

Therefore:

5)

$$n^2(r,t)\left(1-\left(\frac{mc^2}{E}\right)^2\right) = n(r,t)\left(\frac{E}{mc^2}-1\right) \quad -(29)$$

i.e

$$n(r,t) = \frac{\frac{E}{mc^2}-1}{1-\left(\frac{mc^2}{E}\right)^2} \quad -(30)$$

$$= \left(\frac{E-mc^2}{mc^2}\right)\left(\frac{E^2}{E^2-(mc^2)^2}\right)$$

Finally use:

$$E^2-(mc^2)^2 = (E+mc^2)(E-mc^2) \quad -(31)$$

so

$$n(r,t) = \frac{E}{mc^2(E+mc^2)}$$

$$\boxed{n(r,t) = \left(\frac{E}{mc^2}\right)^2\left(1+\frac{E}{mc^2}\right)^{-1}} \quad -(32)$$

<u>This is a</u> <u>constant of motion</u> <u>for all</u> <u>spherical</u> <u>spacetimes.</u> <u>The following</u> <u>theories are refuted.</u>

1) All those that depend on:

$$n(r) = n^{-1}(r) = 1-\frac{r_0}{r} \quad -(33)$$

6) These theories include perihelion precession, light bending by gravitation, black holes, gravitational red shift, black hole theory, frame dragging theory and so on.

2) The big bang theory which depends on the Robertson Walker metric:

$$ds^2 = c^2 dt^2 - \frac{a^2(t)}{1-kr^2} dr^2 - a^2(t) r^2 d\theta^2 \quad -(34)$$

As is well known this is a particular case of eq. (1) with:

$$n(r,t) = 1. \quad -(35)$$

From eq. (32) it is seen immediately that:

$$\left(\frac{E}{mc^2}\right)^2 = 1 + \frac{E}{mc^2} \quad -(36)$$

This is a quadratic of the type:

$$x^2 - x - 1 = 0, \quad -(37)$$

$$\text{so:} \quad x = \frac{E}{mc^2} = \frac{1}{2}\left(1 \pm (1+4)^{1/2}\right) \quad -(38)$$

$$= \frac{1}{2a}\left(-b \pm (b^2 - 4ac)^{1/2}\right) \quad -(39)$$

$$\text{i.e.} \quad \frac{E}{mc^2} = \frac{1}{2}\left(1 \pm \sqrt{5}\right)$$

which is <u>absurd</u> because E is constant.