213(11): Further Refutation of Einsteinian General Relativity (EGR)

The reduction of the geodesic equation:

$$\frac{d^2 x^\mu}{d\tau^2} + \Gamma^\mu_{\rho\sigma} \frac{dx^\rho}{d\tau} \frac{dx^\sigma}{d\tau} = 0 \quad -(1)$$

to the Newton equation in standard EGR consists of assuming:

$$\frac{dx^i}{d\tau} \ll \frac{dt}{d\tau} \quad -(2)$$

and in reducing eq. (1) to:

$$\frac{d^2 x^\mu}{d\tau^2} + \Gamma^\mu_{00} \left(\frac{dt}{d\tau}\right)^2 = 0 \quad -(3)$$

where τ is the proper time (an affine parameter) and where t is the time in the observer frame.

However: $\boxed{\Gamma^\mu_{00} = 0} \quad -(4)$

by antisymmetry, so EGR fails immediately.

The following is one correct ECE method of reducing eq. (1) to Newton's equation. Consider the spacelike part of eq. (1):

$$\frac{d^2 x^i}{d\tau^2} = -\Gamma^i_{jk} \frac{dx^j}{d\tau} \frac{dx^k}{d\tau} \quad -(5)$$

2) Using the method developed in UFT 213:

$$\Gamma^i_{jk} = \frac{1}{r}\epsilon^i_{jk} \quad -(6)$$

$$= -\Gamma^i_{kj}$$

Multiply both sides of eq. (5) by $(d\tau/dt)^2$:

$$\frac{d^2x^i}{dt^2} = -\frac{1}{r}\epsilon^i_{jk}\frac{dx^j}{dt}\frac{dx^k}{dt} \quad -(7)$$

Newtonian dynamics are given by:

$$\frac{d^2x^i}{dt^2} = -\frac{d\Phi}{dx^i} \quad -(8)$$

i.e.
$$\underline{a} = -\underline{\nabla}\Phi \quad -(9)$$

In eq. (8):

$$\frac{d\Phi}{dx^i} = \frac{d\Phi}{dt}\frac{dt}{dx^i} = \frac{1}{r}\epsilon^i_{jk}\frac{dx^j}{dt}\frac{dx^k}{dt} \quad -(10)$$

so
$$\frac{d\Phi}{dt} = \frac{1}{r}\frac{dx^i}{dt}\epsilon^i_{jk}\frac{dx^j}{dt}\frac{dx^k}{dt} \quad -(11)$$

$$\boxed{\Phi = \frac{x^i}{r}\epsilon^i_{jk}v^jv^k = \frac{x^i}{r}vv^i} \quad -(12)$$

with summation over repeated indices. The antisymmetric connection gives the Newton equation.

3) The Newton equation is given by the connection:

$$\boxed{\Gamma^{i}_{jk} = \frac{1}{r}\,\epsilon^{i}_{jk}} \quad -(13)$$

More generally:

$$\frac{d^2x^i}{dt^2} = -\Gamma^{i}_{jk}\frac{dx^j}{dt}\frac{dx^k}{dt} \quad -(14)$$

and most generally:

$$\frac{d^2x^\mu}{d\tau^2} = -\Gamma^{\mu}_{\nu\lambda}\frac{dx^\nu}{d\tau}\frac{dx^\lambda}{d\tau} \quad -(15)$$

This is a much more natural derivation than the Einsteinian derivation, which is incorrect.
