40 Schwarzschild Frequency

The Schwarzschild metric may be modified to represent frequency.

The Schwarzschild Metric;

The Schwarzschild metric may be written as:

$$\partial s^2 = -(R/r)c^2\partial t^2 + (r/R)\partial r^2 + r^2\partial\theta^2 + r^2\mathrm{Sin}^2(\theta)\partial\phi^2$$

Where: the set $(-t, r, \theta, \phi)$ represents the polar co-ordinates of space-time

s is the space-time interval

R is a difference of radial distance; $R = r - r_S$

r_S is the Schwarzschild radius; $r_S = 2Gm/c^2$

c is the light constant

G is the gravitational constant

m is mass

Spatial Structure;

The angles (θ, ϕ) are: $\theta = U_\theta/r$ and: $\phi = U_\phi/w$

Where: U_θ, U_ϕ are the arc lengths

w is a radial distance; $w^2 = x^2 + y^2$

r is a radial distance; $r^2 = x^2 + y^2 + z^2$

the set (x, y, z) represents the Cartesian co-ordinates of space

Spatial structure may be represented as:

$x = w\mathrm{Cos}(\phi)$ and: $y = w\mathrm{Sin}(\phi)$

$z = r\mathrm{Cos}(\theta)$ and: $w = r\mathrm{Sin}(\theta)$

$U_\theta = r\theta$ and: $U_\phi = w\phi$

$\partial U_\theta = r\partial\theta$ and: $\partial U_\phi = w\partial\phi = r\mathrm{Sin}(\theta)\partial\phi$

The Schwarzschild metric may be written as: $\partial s^2 = -(R/r)c^2\partial t^2 + (r/R)\partial r^2 + \partial U_\theta^2 + \partial U_\phi^2$

Reciprocal Wavelength;

Assume the interval (s) reciprocates to the complex interval wavelength ($i\lambda_S$), giving:

$$s + i\lambda_S = 0$$

$$\partial s + i\partial\lambda_S = 0$$

$$\partial s^2 + \partial\lambda_S^2 = 0$$

The Schwarzschild metric may be written as:

$$-\partial\lambda_S^2 = -(R/r)c^2\partial t^2 + (r/R)\partial r^2 + \partial U_\theta^2 + \partial U_\phi^2$$

$$(R/r)c^2\partial t^2 = (r/R)\partial r^2 + \partial U_\theta^2 + \partial U_\phi^2 + \partial\lambda_S^2$$

The Modified Metric;

The geometric average of radial distance (R_G) is: $R_G = (rR)^{½}$

Division of the metric by the squared average gives:

$$c^2\partial t^2/r^2 = \partial r^2/R^2 + \partial U_\theta^2/rR + \partial U_\phi^2/rR + \partial\lambda_S^2/rR$$

$$c^2\partial t^2/r^2 = \partial r^2/R^2 + \partial U_\theta^2/R_G^2 + \partial U_\phi^2/R_G^2 + \partial\lambda_S^2/R_G^2$$

The modified Schwarzschild metric is:

$$c^2/r^2 = (\partial r^2/\partial t^2)/R^2 + (\partial U_\theta^2/\partial t^2)/R_G^2 + (\partial U_\phi^2/\partial t^2)/R_G^2 + (\partial\lambda_S^2/\partial t^2)/R_G^2$$

Frequency;

The modified Schwarzschild metric includes squared velocities (v_n^2):

$$c^2/r^2 = v_r^2/R^2 + v_\theta^2/R_G^2 + v_\phi^2/R_G^2 + v_S^2/R_G^2$$

Frequency (f_n) is: $f_n = v_n/R_n$

Giving the frequency equation; $f_t^2 = f_r^2 + f_\theta^2 + f_\phi^2 + f_S^2$

Where; $c/r = 1/t = f_t$

The Interval Frequency;

The magnitude of spatial frequency (f_R) is related to components of spatial frequency:

$$f_R^2 = f_r^2 + f_\theta^2 + f_\phi^2$$

The interval frequency (f_S) is related to temporal frequency (f_t) and spatial frequency (f_R):

$$f_S^2 = f_t^2 - f_R^2$$

Interference;

A ratio of constructive interference (C) is: $C = (f_t + f_R)/f_S$

A ratio of destructive interference (D) is: $D = (f_t - f_R)/f_S$

The product of opposite ratios is unity: $CD = 1$

Giving the frequencies of space-time; $f_S^2 = f_t^2 - f_R^2$

The Tensor Equation;

The modified Schwarzschild metric includes squared velocities (v_n^2):

$$c^2/r^2 = v_r^2/R^2 + v_\theta^2/R_G^2 + v_\phi^2/R_G^2 + v_S^2/R_G^2$$

$$(R^2/r^2)c^2 = v_r^2 + (R^2/R_G^2)(v_\theta^2 + v_\phi^2 + v_S^2)$$

Assume; $v_1/c = R/r$

$v_r/v_2 = a/b$

$v_\theta^2 + v_\phi^2 + v_S^2 = ½v_3^2$

Giving; $v_1^2 = (a/b)^2 v_2^2 + ½(R^2/R_G^2)v_3^2$

Upgrade scalar velocities to vectors: $\boldsymbol{v_1}^2 = (a/b)^2\boldsymbol{v_2}^2 + ½(R^2/R_G^2)\boldsymbol{v_3}^2$

A basic Tensor ($\underline{\boldsymbol{T_n}}$) is: $\underline{\boldsymbol{T_n}} = \boldsymbol{v_n}^2$

Giving a basic tensor field equation; $\underline{\boldsymbol{T_1}} = (a/b)^2\underline{\boldsymbol{T_2}} + ½(R^2/R_G^2)\boldsymbol{T_3}$

Conclusion;

The Schwarzschild metric may be modified to represent frequency.