Solving incompatibility between GR and QM re black holes

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Abstract: Herein I derive a new metric for Schwarzschild geometry that doesn't predict black holes, thus is compatible with quantum mechanics (QM) re black holes and their singularities.

A new equation for escape velocity

Geometric units are used herein. About spherical shells concentric to a center of gravitational attraction, see the book Exploring Black Holes at Chapter 3.

See Equations for a falling body at "used for large fall distances". The equation there is general relativity's (GR's) for escape velocity when an arbitrarily large distance is input. See Galileo's equation for a falling object in a uniform gravitational field at "falling object after elapsed time". Special relativity (SR) disagrees; its equation for that is eq. 7 at The Relativistic Rocket, since a rocket substitutes for a shell. SR's equation always returns a velocity < *c*.

I reasoned that when I created a conversion equation that converts Galileo's equation for a falling object in a uniform gravitational field to SR's equation for that, then I could use the conversion equation to convert GR's equation for escape velocity into a new equation for escape velocity that's compatible with SR locally and predicts that the escape velocity is < *c* everywhere. Here is the equation that resulted:

$$v_e = \sqrt{\frac{2M}{r + 2M}} \quad [1]$$

A new equation for gravitational time dilation

Let an observer fall freely toward a center of gravitational attraction, starting from relative rest at an arbitrarily large distance above it, while measuring, as a fraction *x* of the observer's own rate of time, the rate of clocks at each shell as they pass right by. The equation for a falling body at "used for large fall distances" shows that each shell is passed at the escape velocity for that shell. Inputting that velocity into the reciprocal of the gamma factor equation yields *x* for that shell. The escape velocity at an arbitrarily

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large distance is zero, so x is unity there. The observer is stationary relative to the falling space, so the observer's rate of time remains the rate of time at a shell at an arbitrarily large distance. Then the gravitational time dilation factor, the rate of time at a shell at a reduced circumference r, as a fraction of the rate of time at a shell at an arbitrarily large distance, is given by the pseudo-equation:

gravitational time dilation factor = reciprocal of gamma factor(escape velocity at r) [2]

I verify this pseudo-equation by showing I can derive GR's equation for the gravitational time dilation factor from it, using the variables defined at Gravitational time dilation at "A common equation used to determine gravitational time dilation", and GR's equation for escape velocity:

$$\frac{t_0}{t_f} = \sqrt{1 - v_e^2} = \sqrt{1 - \left(\sqrt{\frac{2M}{r}}\right)^2} = \sqrt{1 - \frac{2M}{r}}$$

See also Gravitational time dilation at "Here is the proof", and A Non-Mathematical Proof of Gravitational Time Dilation. The new equation for the gravitational time dilation factor, derived using eqs. 1 and 2, is:

$$\frac{t_0}{t_f} = \sqrt{\frac{r}{r + 2M}} \quad [3]$$

A new metric for Schwarzschild geometry

The difference between the metric for flat spacetime and the Schwarzschild metric is GR's gravitational time dilation factor (or gravitational length contraction factor, typically described in other terms like "excess radius", or "space stretching" as in Exploring Black Holes at Chapter 3) that's embedded in the latter. To derive the new metric for Schwarzschild geometry I used eq. 3 to replace those embedded parts of the Schwarzschild metric.

Using the variables defined at More about the Schwarzschild Geometry, the new metric for Schwarzschild geometry is:

$$ds^2 = -\left(r/\left(r + r_s\right)\right) dt^2 + \frac{dr^2}{r/\left(r + r_s\right)} + r^2 do^2$$