An addendum to the theory " On the consequences of a probabilistic space-time continuum".

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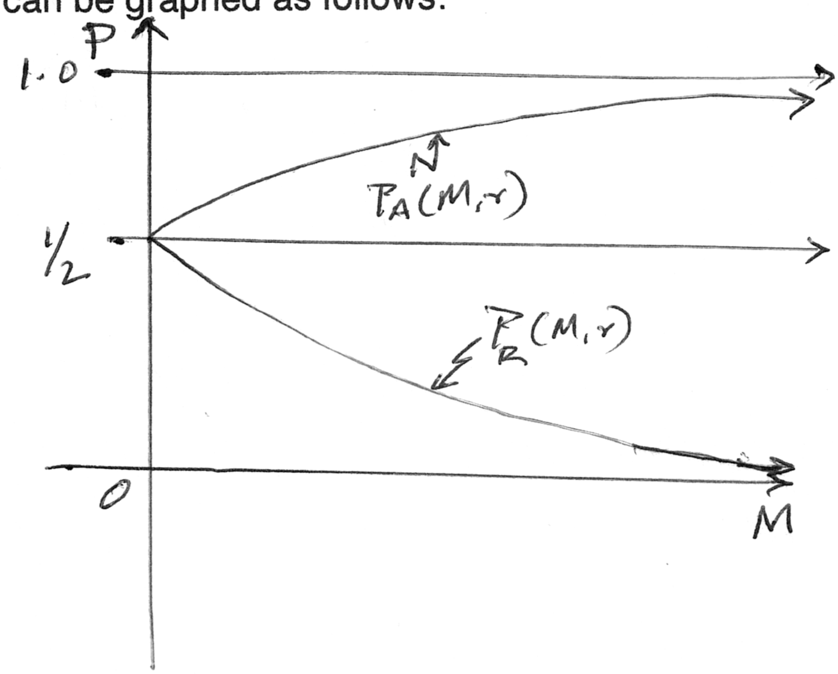
First we have:

1) $\lim_{M \to 0} P_A(M,r), P_R(M,r) \longrightarrow 1/2.$

2) $\lim_{M \to \infty} P_A(M,r) \longrightarrow 1.$

3) $\lim_{M \to \infty} P_R(M,r) \longrightarrow 0.$

This can be graphed as follows:



Taking the modified Newton's law for gravitation expressed in spherical coordinates, we have,

$$F(M,r) = G\frac{M}{r^2}\left(2P_A(M,r) - 1\right)$$

From this we get,

$$\frac{\partial F(M,r)}{\partial M} = G\frac{M}{r^2}\left(2\frac{\partial P_A(M,r)}{\partial M}\right) + \frac{G}{r^2}\left(2P_A(M,r) - 1\right)$$

$$\Rightarrow \frac{\partial P_A(M,r)}{\partial M} = \frac{r^2}{2GM}\left(-\frac{F(M,r)}{M} + \frac{\partial F(M,r)}{\partial M}\right)$$

Taking the 1^{o} approximation of the above equation, we have,

$$\frac{\partial P_A(M,r)}{\partial M} \simeq -\frac{r^2}{2GM^2}F(M,r) \quad \text{or} \quad -\frac{\partial P_A(M,r)}{\partial M} \simeq \frac{r^2}{2GM^2}F(M,r)$$

$$\Rightarrow -\frac{\partial P_A(M,r)}{\partial M} \propto 1/M^2$$

From $-\frac{\partial P_A(M,r)}{\partial M} \propto 1/M^2$ it can be concluded that the larger the mass 'M' of an object the farther away is the 'r_o' of that object, where 'r_o' is the distance to the point of zero net gravity from the center of mass of the object.