Consider the case when both Δm_i and $\Delta m_i'$ do not satisfy Eq.(94), and

$$\Delta m_i >> \hbar / \Delta rc$$

$$\Delta m_i' >> \hbar / \Delta rc$$

In this case, $\Delta m_g \cong \Delta m_i$ and $\Delta m_g' \cong \Delta m_i'$. Thus,

$$\Delta F = -G\frac{\Delta m_i \Delta m_i'}{(\Delta r)^2} = -G\frac{(\Delta E/c^2)(\Delta E'/c^2)}{(\Delta r)^2} =$$

$$= -\left(\frac{G}{c^4}\right)\frac{(\hbar/\Delta t)^2}{(\Delta r)^2} = -\left(\frac{G\hbar}{c^3}\right)\frac{hc}{(\Delta r)^2}\left(\frac{1}{c^2 \Delta t^2}\right) =$$

$$= -\left(\frac{1}{2\pi}\right)\frac{hc}{(\Delta r)^4} l_{planck}^2 =$$

$$= -\left(\frac{\pi}{1920}\right)\frac{hc}{(\Delta r)^4}\left(\frac{960}{\pi^2} l_{planck}^2\right) = -\left(\frac{\pi A_0}{1920}\right)\frac{hc}{(\Delta r)^4}$$

whence

$$F = -\left(\frac{\pi A}{1920}\right)\frac{hc}{r^4} \qquad (107)$$

The force will be *attractive* and its intensity will be the *fourth part* of the intensity given by the first expression (102) for the Casimir force.

We can also use this theory to explain some relevant cosmological phenomena. For example, the recent discovery that the cosmic expansion of the Universe may be *accelerating*, and not decelerating as many cosmologists had anticipated [35].

We start from the Eq.(6) which shows that the *inertial forces*, $\vec{F}_i$, whose acts on a particle, in the case of the force and speed have the *same direction*, is given by

$$\vec{F}_i = \left| \frac{m_g}{(1 - V^2/c^2)^{3/2}} \right| \vec{a}$$

Substitution of m_g given by (43) into the expression above gives

$$\vec{F}_i = \left| \frac{3}{(1 - V^2/c^2)^{3/2}} - \frac{2}{(1 - V^2/c^2)^2} \right| m_{i0}\vec{a}$$

Whence we conclude that a particle with rest inertial mass, m_{i0}, subjected to a force, $\vec{F}_i$, acquires an acceleration $\vec{a}$ given by

$$\vec{a} = \frac{\vec{F}_i}{\left| \frac{3}{(1 - V^2/c^2)^{3/2}} - \frac{2}{(1 - V^2/c^2)^2} \right| m_{i0}}$$

By substituting the well-known expression of Hubble's law for velocity, $V = \tilde{H} l$, ($\tilde{H} = 1.7 \times 10^{-18} s^{-1}$ is the Hubble constant) into the expression of $\vec{a}$, we get *the acceleration for any particle in the expanding Universe*, i.e.,

$$\vec{a} = \frac{\vec{F}_i}{\left| \frac{3}{(1 - \tilde{H}^2 l^2/c^2)^{3/2}} - \frac{2}{(1 - \tilde{H}^2 l^2/c^2)^2} \right| m_{i0}}$$

Obviously the distance l increases with the expansion of the Universe. Under these circumstances it is easy to see that the term

$$\left| \frac{3}{(1 - \tilde{H}^2 l^2/c^2)^{3/2}} - \frac{2}{(1 - \tilde{H}^2 l^2/c^2)^2} \right|$$

decreases, *increasing the acceleration* of the expanding Universe.

Let us now consider the phenomenon of gravitational deflection of light.

A light ray, from a distant star, under the Sun's gravitational force field describes the usual central force hyperbolic orbit. The deflection of the light ray is illustrated in Fig. V, with the bending greatly exaggerated for a better view of the angle of deflection.

The distance CS is the distance d of closest approach. The angle of deflection of the light ray, δ, is shown in the Figure V and is

$$\delta = \pi - 2\beta.$$

Where β is the angle of the asymptote to the hyperbole. Then follows that