This paper is a mathematical continuation to a previous paper
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Calculating Discrete Time Location Force

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The wave emitted from a particle

$$\Psi = \sum_{k=0}^{\infty} \varphi(k,t)$$

For a particular value of k

And assuming that the Number of φ_1 drops off at a rate of

$$N\big(\varphi_1(r)\big) = \frac{N\big(\varphi_1(0)\big)}{4\pi r^2}$$

Where

$$\varphi_1 = A \cdot Sin(\omega t)$$

Interacts with a second wave at its source

$$\varphi_2 = A \cdot Sin(\omega t + \phi)$$

Where

$$\phi(t) = \frac{2\pi \cdot r(t)}{\lambda}$$

$$\omega = 2\pi \cdot f = \frac{2\pi \cdot c}{\lambda}$$

$$\phi(t) = \frac{\omega \cdot r(t)}{c}$$

A force interaction would then be

$$F = -\varphi_1 \cdot \varphi_2$$

And the average force would be

$$F_\tau = \frac{-A^2}{\tau}\int_0^\tau Sin(\omega t) \cdot Sin(\omega t + \phi)\, dt$$

Where

$$\omega \cdot \tau = 2\pi$$

$$F_\tau = \frac{-\omega A^2}{2\pi}\int_0^\tau Sin(\omega t) \cdot Sin(\omega t + \phi)\, dt$$

If ϕ is taken as a constant, the average force over 1 period would be

$$F_\tau = \frac{-A^2}{2} Cos(\phi)$$

$$F_\tau = \frac{-A^2}{2} \cdot Cos\left(\frac{\omega r}{c}\right)$$

Energy is therefore

$$dE_\tau = \frac{-A^2}{2}\int Cos\left(\frac{\omega}{c} \cdot r\right) \cdot dr$$

$$dE_\tau = \frac{-c \cdot A^2}{2\omega} \cdot Sin\left(\frac{\omega \cdot r}{c}\right)$$

The total average force on the particle from another particle is

$$\mathrm{F}_{total} = \frac{-1}{8\pi r^2}\sum_{k=1}^{n} N_{0_k} \cdot {A_k}^2 \cdot Cos\left(\frac{\omega_k r}{c} + \phi_k\right)$$

$$\mathrm{dE}_{total} = \frac{-c}{8\pi r^2}\sum_{k=1}^{n}\left(\frac{N_{0_k} \cdot {A_k}^2}{\omega_k}\right) \cdot Sin\left(\frac{\omega_k r}{c} + \phi_k\right)$$

Where

$$\omega_k = \frac{\omega_{max}}{k}$$

$$\phi_k = \frac{2\pi}{k} \cdot l$$

$$l = 0,1,2,3 \ldots$$

The particle will constantly be trying to find a location in space where

$$\mathrm{dE}_{total} \rightarrow -\infty$$

$$\frac{d\mathrm{E}_{total}}{dt} = -\frac{d}{dt}\left(\frac{m\dot{r}^2}{2}\right)$$

$$\frac{d\mathrm{E}_{total}}{dr} = \mathrm{F}_{total}$$

This location is the Discrete Time Location.

Sample values within DTL for basic particles

Between Electrons

$$A_1 = b_1$$

$$A_2 = b_2\ ;\ \phi_2 = 0$$

$$A_{3+} = 0$$

Between Positrons

$$A_1 = b_1$$

$$A_2 = b_2\ ;\ \phi_2 = \pi$$

$$A_{3+} = 0$$

Between Quarks

$$A_1 = b_x$$

$$A_2 = \pm\frac{b_2}{3}, \pm 2\cdot\frac{b_2}{3};\ \phi_2 = 0, \pi$$

$$A_3 = b_3\ ;\ \phi_2 = 0, 2\frac{\pi}{3}, 4\frac{\pi}{3}$$

*note it may turn out that because of the wave balance, all values of A_k are identical.