Dark matter and Dark Energy Space Time Interval

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Abstract

This paper explains the origin and cause of why we see effect of Dark matter and Dark energy, aim of this paper to get space time interval for dark matter and dark energy, with help of higher dimensions and holographic principle.

Keywords – *Dark matter, Dark Energy, Space Time interval, Holographic principle.*

I. INTRODUCTION

Objective of this paper to write space time interval equations for Dark matter and Dark energy using complex plane in higher dimensions.

II. DARK MATTER AND DARK ENERGY TO DUE TO HOLOGRAPHIC PRINCIPLE

In paper "Dark Matter, Dark Energy and Quantum Entanglement Decoded" [1], it was mentioned that Dark matter and Dark energy are manifestation of holographic principle. Registered spaces in holographic plane curves space time in our universe and gives illusion of Dark matter and Dark energy. In this paper it was not clearly mentioned how this space time curvature acts in our real universe.

III. SPACE TIME INTERVAL FOR ALL FUNDAMENTAL FORCES

In paper space time interval for all fundamental forces [2], we saw that space time interval can be written in this form for all fundamental forces.

$$s^2 = \overset{rr}{\eta}_{\mu\nu} x_\mu x_\nu + \overset{ii}{\eta}_{\mu\nu} x_\mu x_\nu + \overset{rr1}{\eta}_{\mu\nu} \alpha_\mu \alpha_\nu$$

$$+ \overset{ii1}{\eta}_{\mu\nu} \alpha_\mu \alpha_\nu + \overset{ri1}{\eta}_{\mu\nu} \alpha_\mu \alpha_\nu - Eq1$$

Where first term is for gravity, second term is for strong forces, third term is for electrostatic forces, fourth term is of magnetic forces and last term is of weak nuclear forces. This equation does not cover dark matter and dark energy space time interval.

IV. SPACE TIME INTERVAL OF DARK MATTER AND DARK ENERGY

If we split Eq1 in higher dimensions we will get following matrix.

$$s^2 = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 \end{bmatrix} \begin{bmatrix} (x_{r(-1)})^2 \\ (y_{r(-1)})^2 \\ (z_{r(-1)})^2 \\ (ct_{r(-1)})^2 \\ (x_{i(-1)})^2 \\ (y_{i(-1)})^2 \\ (z_{i(-1)})^2 \\ (ct_{i(-1)})^2 \end{bmatrix}$$

Where $x_{r(-1)}$ denotes dimension of x in real plane and -1 denotes one dimension higher than our dimensions.

We know that space time interval for all fundamental forces can be written as

$$\overset{c}{\eta} = \begin{bmatrix} \overset{rr}{\eta} & \overset{ri}{\eta} \\ \overset{ir}{\eta} & \overset{ii}{\eta} \end{bmatrix}$$

$$s^2 = \overset{c}{\eta} \alpha_\mu \alpha_\nu$$

The above matrix (for higher dimension) can be written in similar manner as

$$\overset{c(-1)}{\eta} = \begin{bmatrix} \overset{rr(-1)}{\eta} & \overset{ri(-1)}{\eta} \\ \overset{ir(-1)}{\eta} & \overset{ii(-1)}{\eta} \end{bmatrix}$$

$$s^2 = \overset{c(-1)}{\eta} \alpha_\mu \alpha_\nu$$

But we know that $\overset{ri(-1)}{\eta}$ is mix matrix and should be equal to space time interval tensor of all fundamental forces, than we can write $\overset{c(-1)}{\eta}$.

$$\overset{c(-1)}{\eta} = \begin{bmatrix} \overset{rr(-1)}{\eta} & \overset{c}{\eta} \\ \overset{ir(-1)}{\eta} & \overset{ii(-1)}{\eta} \end{bmatrix}$$

Dark matter space time interval is like a nuclear force in our dimensions which acts at smaller level and hence it should be associated with $\overset{ii(-1)}{\eta}$ tensors and similarly dark energy is like gravity in our universe and should be associated with $\overset{rr(-1)}{\eta}$ tensors.

Hence we can write Dark matter spacetime interval as

$$s^2 = \overset{ii(-1)}{\eta} x_\mu x_\nu - Eq2$$

And Dark energy space time interval as

$$s^2 = \overset{rr(-1)}{\eta} x_\mu x_\nu - Eq3$$

V. SPACE TIME INTERVAL FOR ALL FUNDAMENTAL FORCES AND DARK ENERGY

From Equation 1, 2 and 3 we can write space time interval for all fundamental forces, Dark matter and Dark Energy as

$$s^2 = \overset{rr}{\eta}_{\mu\nu} x_\mu x_\nu + \overset{ii}{\eta}_{\mu\nu} x_\mu x_\nu + \overset{rr1}{\eta}_{\mu\nu} \alpha_\mu \alpha_\nu$$
$$+ \overset{ii1}{\eta}_{\mu\nu} \alpha_\mu \alpha_\nu + \overset{ri1}{\eta}_{\mu\nu} \alpha_\mu \alpha_\nu + \overset{rr(-1)}{\eta} x_\mu x_\nu + \overset{ii(-1)}{\eta} x_\mu x_\nu$$

Where the last two terms are for Dark Energy and Dark matter and rest of the terms are for all fundamental forces.

VI. CONCLUSION

Dark matter and Dark energy are due to curvature of complex space time in higher dimensions and not due to WIMPS or MACHOS as suggested by leading theories which tries to explain the origin of Dark matter.

REFERENCES

[1] Bhushan Poojary, "Dark Matter and Quantum Entanglement Decoded," International Journal of Applied Physics and Mathematics vol. 4, no. 3, pp. 180-183, 2014.

[2] Bhushan Poojary, "Space time interval for all fundamental forces," SSRG International Journal of Applied Physics (SSRG-IJAP) – volume 2 Issue 1 Jan-Feb 2015, pp. 1-4, 2015.