A possible explanation of the nature of dark matter by Newtonian mechanics

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Abstract

We calculate the trajectory of a moving object on earth and the trajectory of the earth around the sun in a fourdimensional space (x, y, z, t). We see that the trajectory has a mass: this is what is called dark matter which mass depends on the mass of the moving object. Indeed the deformation of space, the track, deviates light as we are at the hypersurface of the universe, and that is the method of measurement of the 'mass' of the universe.

Keywords: dark matter; Newtonian mechanics

INTRODUCTION

I make here the hypothesis that our three dimensional universe with physical laws is embedded in a four-dimensional space where no physical law exist [1, 2]. Time is a function of the radius of curvature of our universe and this leads to the acceleration of the expansion of our universe [4].

The model of dark matter that I present here is based on the fluctuations of the hyper-surface of our universe. Our universe is three dimensional and curved, therefore it may be embedded in a four dimensional space with no curvature. The hyper-surface of our universe is superimposed to our present universe. But this hyper-surface is not 'smooth', this means that it may contain fluctuations. These fluctuations are due to real matter (due to the changes of curvature due to gravitation) but also to dark matter (or at least 'are' dark matter). Indeed, the local changes in the curvature of our universe may lead to what we call dark matter. This dark matter, although it is only a local deformation of the hyper-surface of our universe, may deviate radiations and can account for gravitational effects [5].

TRAJECTORIES

In Newtonian mechanics

$$m\mathbf{a} = m\mathbf{g} \tag{1}$$

where **a** is the acceleration, m the mass of the moving object and **g** the gravitational acceleration on a given point on earth. As said before, our universe is threedimensional and curved and it can be embedded in a fourdimensional euclidean space. So we integrate equation (1) over x, y, z and t even if this corresponds not exactly to a euclidean space because t is not linearly proportional to a space dimension [1–4].

$$\int_{\infty}^{\infty} m\mathbf{a}dxdydzdt = \tag{2}$$

$$\int_{\infty}^{\infty} m\mathbf{g}dxdydzdt \tag{3}$$

and

$$\int_{\infty}^{\infty} m\mathbf{v}dxdydzdt = \tag{4}$$

$$\int_{\infty}^{\infty} m\mathbf{g}(x\mathbf{i} + y\mathbf{j} + z\mathbf{k} + t) + \tag{5}$$

$$m\mathbf{v_0} + (x_0\mathbf{i} + y_0\mathbf{j} + z_0\mathbf{k} + t_0)dxdydzdt \tag{6}$$

and

$$m(x\mathbf{i}+y\mathbf{j}+z\mathbf{k}) = \tag{7}$$
$$m\mathbf{g}(x^2/2\mathbf{i}+y^2/2\mathbf{j}+z^2/2\mathbf{k}+t^2/2)+ \tag{8}$$
$$m\mathbf{v}_0(x\mathbf{i}+y\mathbf{j}+z\mathbf{k}+t)+(x_0x\mathbf{i}+ \tag{9}$$
$$y_0y\mathbf{j}+z_0z\mathbf{k}+t_0t) \tag{10}$$

where $\mathbf{v_0}$ is the initial velocity and x_0, y_0, z_0, t_0 its starting point. So the trajectory of the object is a second order equation and not exactly a parabola.

For the trajectory of earth around the sun we have, in Newtonian mechanics:

$$m\mathbf{a} = \frac{GMm}{r^2}(x_r\mathbf{i}+y_r\mathbf{j}+z_r\mathbf{k}) \tag{11}$$

where G is the gravitational constant in Newtonian mechanics, r is the distance between the sun and earth at time t_0,$x_r\mathbf{i}+y_r\mathbf{j}+z_r\mathbf{k}$ the vector directed from earth to the sun at time t_0..

$$\int_{\infty}^{\infty} m\mathbf{a}dxdydzdt = \tag{12}$$
$$\int_{\infty}^{\infty} \frac{GMm}{r^2}(x_r\mathbf{i}+y_r\mathbf{j}+z_r\mathbf{k})dxdydzdt \tag{13}$$

and

$$\int_{\infty}^{\infty} m\mathbf{v}dxdydzdt = \tag{14}$$
$$\int_{\infty}^{\infty}(\frac{GMm}{r^2}(x_r\mathbf{i}+y_r\mathbf{j}+z_r\mathbf{k})(x\mathbf{i}+y\mathbf{j}+z\mathbf{k}+t)+ \tag{15}$$
$$m\mathbf{v_0}+(x_0\mathbf{i}+y_0\mathbf{j}+z_0\mathbf{k}+t_0))dxdydzdt \tag{16}$$

and

$$m(x\mathbf{i}+y\mathbf{j}+z\mathbf{k}) = \tag{17}$$
$$\frac{GMm}{r^2}(x_r\mathbf{i}+y_r\mathbf{j}+z_r\mathbf{k})(x^2/2\mathbf{i}+y^2/2\mathbf{j}+z^2/2\mathbf{k}+t^2/2)+ \tag{18}$$
$$m\mathbf{v}_0(x\mathbf{i}+y\mathbf{j}+z\mathbf{k}+t)+(x_0x\mathbf{i}+y_0y\mathbf{j}+z_0z\mathbf{k}+t_0t) \tag{19}$$

This is the trajectory of earth around the sun.You may see that the trajectory has a mass m: this is dark matter; this is mass without the presence of an object or more precisely deformation of space due to the former presence of an object.

CONCLUSION

Dark matter is in fact the track of the planets in the solar system, and of objects in the universe. This explains why we do not 'see' all the mass present in the universe. Indeed the present methods use the trajectory of electromagnetic waves and particles coming from space to measure the mass of the universe and these are deviated by the track of real mass.

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