Simulation Hypothesis and Dark Matter

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Abstract

Dark Matter is presented as a consequence of the hypothesis of simulation, in particular of augmented reality (AR). A mathematical confirmation is given.

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Because dark matter has not yet been observed directly, it must barely interact with ordinary baryonic matter and radiation, except through gravity, if it exists. Most dark matter is thought to be non-baryonic; it may be composed of some not yet discovered subatomic particles. The primary candidate for dark matter is some new kind of elementary particles that have not yet been discovered, in particular weakly interacting massive particles (WIMPs). Many experiments to directly detect and study dark matter particles are being actively undertaken, but none have yet succeeded.

Elon Musk, a highly authoritative figure, talks on YouTube that most likely our world is an intelligent simulation. He has mentioned the idea that part of our world is simulated (part A), and part is not (part B): it is like "augmented reality" (check this term in Wikipedia), made by highly advanced beings. I argue that part B is a galaxy, but part A is the Dark Matter surrounding that galaxy. Hereby, I am calling Dark Matter being the virtual reality, the virtual matter.

Indeed, the failure of direct detection of Dark Matter tells at least to me that Dark Matter passes through our reality as being free from interaction with it. Gravity is not the direct-contact interaction, as is known. This is just like the augmented reality of the Pokémon Go game; the virtual monster Pokémon is being placed into our reality without direct interaction with it. [2]

It is understandable why underground detectors for particles of Dark Matter have caught absolutely nothing for so many years of work. Usually, particles have a pretty strong effect on our world. But such small corpuscles as neutrinos have the weakest effect on ordinary matter. I give convincing arguments that Dark Matter acts so weakly on our world that its direct-contact action is equal to zero. That is why Dark Matter passes through the devices that are built for its capture completely without noticing them, completely without labor and friction with these devices. Such Dark Matter is a representative of the "invisible" world, i.e. the detectors trying to detect it locally are "blind", they see nothing. It falls into the third category of matter, classified as follows:

1. Living visible matter - people, animals, artificial animals (latter is Artificial Intelligence), plants, microbes, insects, fish.

2. Non-living visible matter - stones, rocks, ice.

3. Non-living invisible matter - Dark Matter, Dark Energy.

4. Living invisible matter - the prediction of my classification of matter. The candidates belong to Religion (angels, souls; demons) and the cloaking technology of the Star Trek serial (that is how UFO vanishes).

According to my classification, phosphorus found in nature will be part of inanimate matter, and phosphorus in the human body will be part of living matter. For example, as long as feces are in the body, they are part of a person.

The periodic table of Dmitri Mendeleev has predicted many chemical elements. Recall also the story of the positron [it is like a "positively charged electron"]: the existence of this elementary particle was predicted. I also have a logical classification table. I predicted the discovery of angels.

An angel is made of living invisible matter. His motives and aspirations are his spiritual side: the angel is either fallen or real. God is Spirit. There are two spirits: the evil spirit and the Holy Spirit. Spirit is not Matter, and Matter is not Spirit.

I. WHO HAS "CREATED" GOD?

A being who would know everything also knows that God exists. Because God is Omniscient. Therefore, among all knowledge, there is also this: ''God exists.''

It is not just another form of the ontological argument of St. Anselm. Instead, I have discovered something new.

I have no PREMISES, I have 100% sure proof. The proof can be understood even by a non-educated skeptic.

I like the word IF, it is not from satan and it is often used in proofs: If some being gets to know all, then he will get to know that God exists. Thus, God exists. But I can use the word WHEN: When you get educated enough, you will become the theist. Because God is the theist because He is the origin of Theism. One of His names is Theism.

Somebody could ask: "And the one who knows everything, does he know how to learn something new?" This is not a question, but a statement, which says in short: "There is no God." Just like the question of Pontius Pilat "What is Truth?" (John 18:38) was a rhetoric one.

The expression "Who created God?" is not a question, but the statement "There is no God", expressed differently, but also in a popular way. In the same way, the question "Can God create a stone that He cannot lift" is not a question, but a statement of "There is no God."

IT IS BECAUSE THE Reason tells us that there is no proof of the "Absence" of God, and cannot be even in principle. Hereby God is not an alien, who lives in a distant galaxy, but He lives on Earth because He is Omnipresent (so one can easily find and reach Him). And such rhetoric questions above like "who has created God?" are simply another variant of the original "No God" written in a less crazy appearance.

I have the following logic:

1. The paradox of Omnipotence cannot be resolved.

2. Therefore, it seems that God is disproven.

3. However, God can never be disproven.

4. Thus, the omnipotence paradox is just re-casting the creed of disbelief: "No God." It adds no additional information to the Status Quo.

II.   EQUATIONS OF GEODETIC MOTION

Consider Reissner-Nordström black hole. From the rest state at $r = R$, let us release a small, electrically neutral test body.

The metric is t-independent, so the test-body has a velocity component $u_t = -E = $ const. The falling is radial, so $u^\theta = u^\phi = $ const $ = 0$. Using normalized velocity vector with $u_\nu u^\nu = g^{tt} u_t u_t + g_{rr} u^r u^r = E^2/(-A) + (u^r)^2/A = -1$, for the radial component of velocity one has

$$(u^r)^2 = E^2 - A,\tag{1}$$

where $A = 1 - 2M/r + Q^2/r^2$. Starting at $r = R$ with radial velocity $u^r = 0$, one has

$$E^2 = 1 - 2M/R + Q^2/R^2,\tag{2}$$

and

$$(u^r)^2 = Q^2(1/R^2 - 1/r^2) + 2M(1/r - 1/R) = (1/r - 1/R)(2M - Q^2[1/R + 1/r]).\tag{3}$$

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For $r < R$ with $(u^r)^2 > 0$, one obtains $r > r_m = 1/(2M/Q^2 - 1/R)$. Thus, the test-body has not reached the singularity at $r = 0$.

III.   VANISHING SIZE

Further research has shown that the proper size of the body shrinks to zero at $r = r_m$.

Consider a drop of "perfect fluid" falling into a Black Hole. Because the drop is small, the velocity of every part of it is the velocity of the fall. The equation of matter is $T^{\mu\nu}_{;\nu} = 0$, thus $u_\mu T^{\mu\nu}_{;\nu} = 0$, where

$$T^{\mu\nu} = (\rho + p)u^\mu u^\nu + p\, g^{\mu\nu}\,, \tag{4}$$

where pressure p and density ρ are the inner characteristics of the drop. Thus,

$$-(\rho + p)_{,\nu}\, u^\nu - (\rho + p)\, u^\nu_{;\nu} + (\rho + p)\, u^\nu\, u^\mu_{;\nu} u_\mu + p_{,\nu}\, u^\nu = 0\,, \tag{5}$$

where $u^\mu_{;\nu} u_\mu = 0$, because $(u^\mu u_\mu)_{;\nu} = (-1)_{;\nu} = 0$. As $u^\nu = dx^\nu/ds$, one has

$$-\frac{d(\rho + p)}{ds} - (\rho + p)\, u^\nu_{;\nu} + \frac{dp}{ds} = 0\,. \tag{6}$$

Here and in the following, the index with semicolon means the covariant derivative uses Christoffel symbols, while the index with comma means the ordinary derivative with respect to the spacetime coordinate.

This differential equation has no solution, unless the fluid is compressible. Let the equation of state be $p = p(\rho)$. Then

$$\frac{d\rho}{ds} = -(\rho + p(\rho))\, u^\nu_{;\nu}\,. \tag{7}$$

Now the rate (and sign) of the change of the density depends on $D := u^\nu_{;\nu}$, and the formula coincides with the one given in Ref. [1], pages 226–227.

If one inserts the above velocity u^ν into the divergence, one gets to know that $u^\mu_{;\mu} \sim 1/u^r \to -\infty$ at $r = r_m$. The idea of the paper is proven now because the position of the latter special point r_m coincides with the special point r_m in the previous chapter, derived by the first method.

It is interesting to note that for a Schwarzschild Black Hole ($M \neq 0$, $Q = 0$) one has

$$D := M\, \frac{4\, r - 3\, R}{\sqrt{2\, M\, R\, r^3\, (R - r)}} \tag{8}$$

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With the zero at $r = 3R/4$ being the starting point for the compression. Notably, this happens at an infinite distance from the Black Hole, if R is infinite. Such an unexpected result hardly can be found in Newton's age, even while we still have a weak field at $r = (3/4)R \gg 2M$. The deadly ripping with $D \gg 1$ never begins, but the deadly compression with $D \ll -1$ happens at the singularity $r = 0$. This has been shown by several methods, including the study of the geodetics deviation equation. The effects of this paper are found in Kerr and Kerr-Newman spacetimes. As well vanishing of particles with light-like geodesic is found. [3]

The drop's density at $r \to r_m$ diverges because of

$$\frac{d\rho}{\rho} = \left(-D - D\frac{p(\rho)}{\rho} \right) ds \,. \tag{9}$$

Integration of both sides produces

$$\ln(C\,\rho) = \int \left(-D - D\frac{p(\rho)}{\rho} \right) ds = \int \left(\frac{D}{u^r} + \frac{D}{u^r}\frac{p(\rho)}{\rho} \right) dr = \infty \,,$$

where C is a constant of integration.

IV. SOLUTION TO THE CONTRACTION

Because the contraction seems to go beyond the energy-momentum conservation law and General Relativity, I have endured the known law $T^{\nu\mu}_{;\nu} = 0$ with the tensor of invisible Virtual Matter $X^{\nu\mu}$,

$$(T^{\nu\mu} + X^{\nu\mu})_{;\nu} = 0 \,. \tag{10}$$

I call the Virtual Matter "invisible" because it should go through underground "detectors of Dark Matter" without the slightest effort. Why? Because being just a mathematical fix to the contraction of the test body, Virtual Matter is not a new kind of matter; hence, it does not interact with the visible matter even via the weak interaction. To my understanding, Virtual Matter with $X^{\nu\mu}_{;\nu} = 0$ is called Dark Matter, and Dark Matter with $X^{\nu\mu} = -\Lambda\,g^{\nu\mu}$, where Λ is the cosmological constant, is called Dark Energy.

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[1] A. P. Lightman, W. H. Press, R. H. Price, S. A. Teukolsky, "Problem Book in Relativity and Gravitation," Princeton University Press, Princeton, 1975.

[2] Pokémon Go is a 2016 augmented reality (AR) mobile game developed and published by Niantic in collaboration with Nintendo and The Pokémon Company for iOS and Android devices. The game uses mobile devices with GPS to locate, capture, train, and battle virtual creatures, called Pokémons, which appear as if they are in the player's real-world location.

[3] Dmitri Martila, new results, 2020, to be published