Is the Recession of Galaxies phenomenon a proof that the structure of reality differs from the currently accepted one?

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Abstract

A new, incredibly simple justification of the Hubble's law, which results from the recently published alternative model of reality, suggests that the shape of reality can be different than it has been assumed until now.

Introduction

In this paper I would like draw attention to a problem ignored by the physicist community, namely the relation between the observed shape of reality and its actual shape. This problem cannot be ignored because, as the history has shown, assuming that the observed shape of reality is identical with its actual shape has led, for instance in the case of describing planetary motions, to the construction of an unnecessarily complicated model, which ultimately proved false. Currently we describe the reality using a coordinate system based on three space dimensions and one time dimension, which we can directly perceive. The space- or time character of dimensions is assumed to be an integral property of the reality. Describing the reality with spacetime dimensions has led physicists to create complicated and counterintuitive description of the relativistic phenomena using covariant notation, or explaining quantum physics using operators and wave functions. Keeping in mind the historical geocentric model of reality, where the complicated and counterintuitive tools were created as a result of founding the model on the wrong system of coordinates we can ask: is the current model of the reality complicated due to the actually complex structure of the reality itself, or is it due to adopting an incorrect coordinate system as the basis of the model? In other words: is the true shape of the reality identical with the observed spacetime, or does it somehow differ from what we are observing?

The proposed approach

We receive all information regarding our environment through interactions with the surrounding bodies. In current models it is assumed that the interactions propagate along three out of four dimensions of the spacetime. However, why exactly are these three specific dimensions designed to carry the interactions? To solve this problem, I would like to propose an opposite approach: let us assume that interactions do not propagate along specific dimensions in the spacetime, but rather we interpret **the directions along which the interactions are received** as the **dimensions of space**. By applying this assumption, we can build a model of reality which is four dimensional and Euclidean. This Euclidean reality will be named FER – Four dimensional Euclidean Reality. All four dimensions of FER are identical and interactions can propagate in any direction in this reality. In FER objects/particles move along their trajectories which – in case of straight trajectories - are also the time axes of local coordinate systems bound with these objects/particles. The interactions are emitted by the observed particles perpendicularly to their trajectories. It means that we interpret directions perpendicular to trajectories of observed objects as our space dimensions. Such mechanism of observation ensures that the reality itself is Euclidean, but the perceived shape of this reality is the Minkowski spacetime [1]. The cost we have to pay for this simple model of Euclidean reality, is that in case of observation of different objects/particles, we have to interpret different directions in FER as the space dimensions. Of course, in case of our non-relativistic world, the observed reality is identical with FER. The differences begin in case of velocities comparable with the speed of light.

The way this model works will be shown below using the example of the recession of galaxies.

The Recession of Galaxies according to the proposed model

Current model of reality, which is the basis for building all the existing models in astronomy, as well as relativistic or quantum physics, assumes that for each observer, a spacetime coordinate system can be chosen, in which motions of all the other bodies can be described. Such spacetime was defined by Minkowski and it is the foundation of modern physics - Fig. 1a.

The recently presented alternative philosophy of reality [1] assumes that the reality is four dimensional and Euclidean (FER) and is built of four identical dimensions which do not have the meaning of time or space. Trajectories of bodies in FER have a meaning of time axes of their coordinate systems. What we interpret as the space dimensions are the directions along which the interactions are propagating, which are perpendicular to trajectories of currently observed bodies in FER.

In practice, it means that for observation of each body, a separate set of three directions, interpreted as the space dimensions, must be defined – fig. 1b as opposed to what has been assumed so far, where a single set of directions could be applied to describe all bodies – fig. 1a.

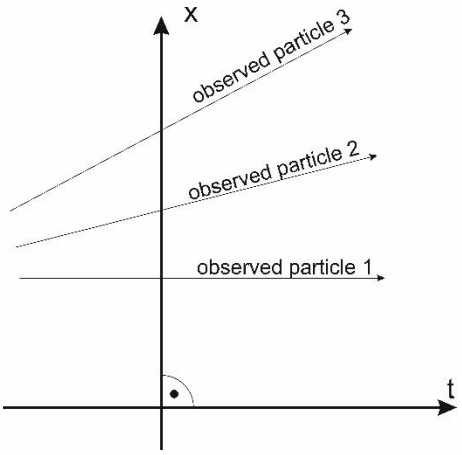

Fig. 1a. Observation of multiple bodies/particles in Minkowski spacetime. The motion of multiple bodies can be described in a single observer's coordinate system. The "true reality" – Minkowski space time – is described with the coordinate system xt

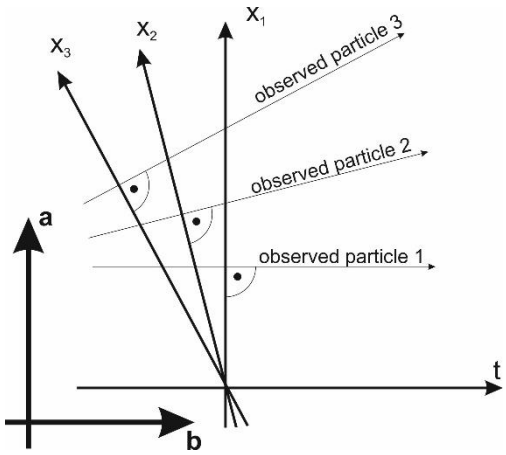

Fig. 1b. Observation of multiple bodies/particles in the FER model. For observation of each of the bodies, we interpret a different set of directions in FER - perpendicular to the trajectory (a time axis of local coordinate system) of an observed body - as the space dimensions. Here, the particle 1 is observed in the coordinate system x_1t, particle 2 in x_2t, particle 3 in x_3t. An observer is not able to distinguish these directions and has an impression all the particles/bodies he observes move along the same set of directions (space dimensions). The "true" reality - FER - is described with the coordinate system ab

If we apply the philosophy of observation of bodies according to the FER model (Fig. 1b) to the problem of recession of galaxies, then a simple formula for the velocity of galaxies describes an increase of observed velocities proportional to the distance, correlation of the Hubble's constant with age of the Universe, and decreasing of the Hubble's constant with the flow of time – Fig.2.

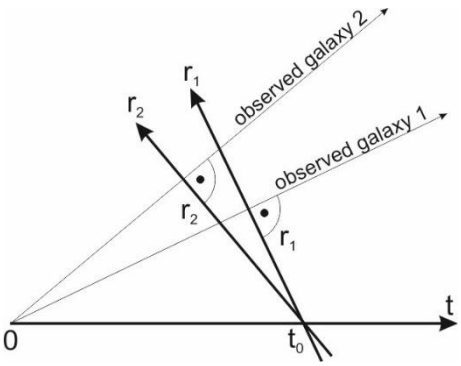

Fig. 2: Trajectories of two galaxies and an observer intersect in point t=0 being the point of Big Bang.

The observer in the moment of measurement is in point t_0 on its trajectory, which is also its time axis. The time t_0, for the observer, then, is the age of the Universe.

The observer measures his distance from galaxies along a direction perpendicular to the trajectory of the currently observed galaxy. He observes the galaxy 1 along direction r_1, the galaxy 2 - along direction r_2. When measuring distances from the galaxies, the observer can see that the galaxy 1 is moving with velocity $V_1 = \frac{r_1}{t_0}$ while the galaxy 2 is moving with velocity $V_2 = \frac{r_2}{t_0}$. So, the velocities of galaxies are perceived by an observer as proportional to the distance from a galaxy. At the same time, the coefficient of proportionality is equal to the inverse of age of the Universe $H = \frac{1}{t_0}$. Since the observer is moving along his trajectory (his axis of time), we can immediately conclude that the Hubble's constant will decrease with the time flow.

Fig. 2 shows the simplest derivation of Hubble's law; a simpler derivation probably could not be found. The derivation is so obvious and so immediate that it could be said that it was Hubble who, while formulating his law, first described the mechanism of observation of objects in Euclidean reality, proposed in this paper.

However, the new philosophy of the reality allows to simplify more than just one particular phenomenon.
The same philosophy, applied to relativistic problems, allows to explain, in a similarly simple way, the mechanism of all of the relativistic phenomena and also to solve many problems which could not be explained within the Theory of Relativity, as for instance the constancy of the speed of light (accepted in TR as a postulate), the Mach principle, binding the TR with Quantum Mechanics, and many more. Description of these and other problems can be found in [1].

I would like to emphasize that from point of view of logic, the assumption that the directions of propagation of interactions, sent by observed particles, are interpreted by us as the space dimensions, is more obvious than currently accepted assumption that, because of certain mysterious properties of the reality, only the specified three of four dimensions of the reality are designed to carry the interactions.

Conclusions

The explanation of the recession of galaxies phenomenon presented here is the most spectacular achievement of the FER model which convinced me of the correctness of this innovative approach. The model that allows to simplify the description of the reality to such an extend (see also solutions to other problems [1]) and greatly expands the range of phenomena that can be described within a single model, should be treated seriously. On the other hand, the changes proposed by this model are huge and the currently used tools like covariant notation, Lorentz groups, etc. become unnecessary. Therefore, I understand there might be misunderstandings, unwillingness to consider my idea, or even hostility from a significant portion of the scientific community, those who have been working hard and building their careers using these established tools for years. However, regardless of these misgivings, the presented model is proof that the Minkowski model of reality is not the only

possible solution to problems concerning relativity, and that the true shape of the reality can differ from its observed shape.

References

[1] W. Nawrot „Alternative Idea of Relativity” http://article.sapub.org/10.5923.j.ijtmp.20170705.01.html and references therein