The density interpretation of wave function

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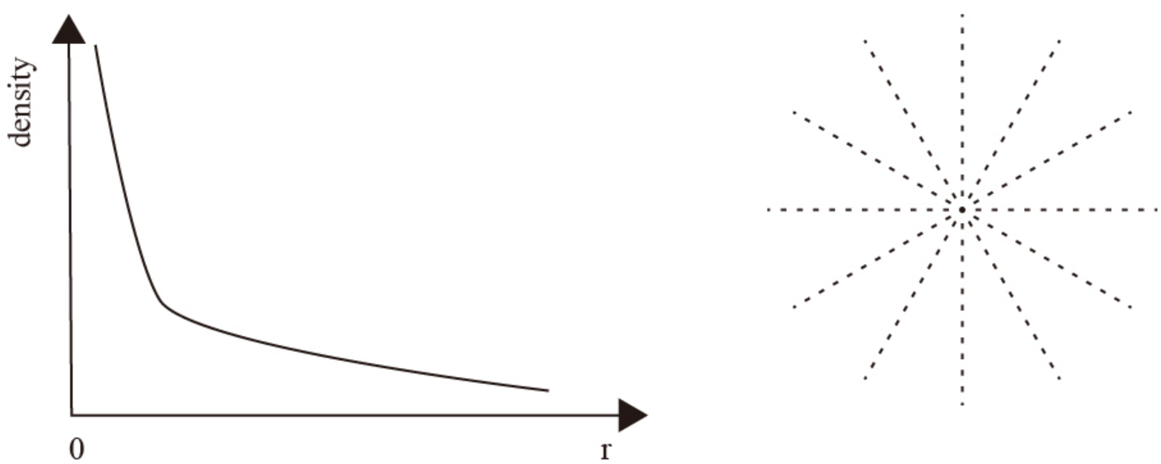
Abstract
General relativity and quantum mechanics are two very important theories in modern physics, but they have incompatibilities when describing the laws of nature. We have found a way to solve this problem --- using density to explain the wave function, and replacing probability with density. It can explain some problems in quantum mechanics, such as wave-particle duality, uncertainty principle, quantum entanglement, and so on. It can also explain gravity.

Keyword
Wave function, probability density function, density, quantum mechanics, general relativity

Text

About this method and a tool:
1 The density interpretation of the wave function (we temporarily call this theory D-P)
The probability density function describes the probability distribution of particles in space at time t. If we replace probability with density, we obtain the density distribution of particles in space at time t. In this case, the particle appears as a sphere. The radius of the sphere is infinite. The center of the sphere has the highest density, and the density decreases as the radius increases. Figure 1

figure 1

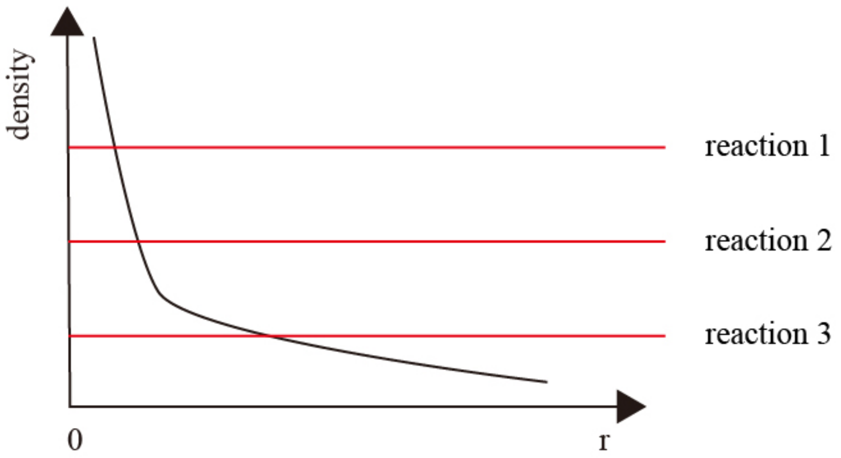


We think the world is made up of such spheres. In other words, the basic unit of the world is this sphere. We call it "t unit".

2 Density-reaction law (we temporarily call this theory D-R)
(1) In any given reaction, the overall density of the reaction system decreases.
(2) Corollary: there is a minimum density requirement for any given reaction, and the reaction will not occur below this density.
(3) Corollary: reaction intensity is positively correlated with density.

In all known reactions, including the big bang, D-R is true. It is an essential tool, and we will use it soon. Figure 2

figure 2 Each given reaction has its minimum density requirement



Use this method and tool to explain some problems:

1 Wave particle duality
It can be seen from D-P that particles have the characteristics of waves. It can be seen from D-R that although the radius of the particle is infinite, only a part of the particle participates in the specific reaction. Because only a part of the density of this particle meets the minimum density requirements of a specific reaction. Thus, the particles exhibit the characteristics of particles. Figure 3

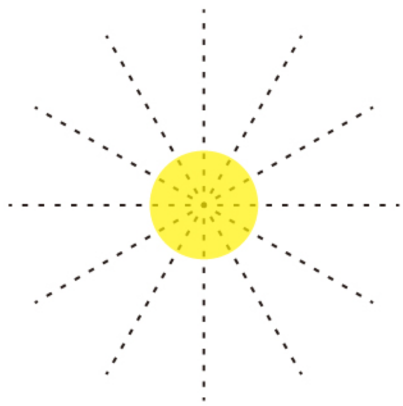


figure 3 Overall manifested as waves, locally manifested as particles

We believe that the essence of wave function collapse and wave particle duality is the same.

2 Uncertainty principle

It can be seen from D-P and D-R that the lower the minimum density requirement for the specified reaction, the more parts of the particles involved in the reaction, the larger the radius of the particles involved in the reaction, and the more imprecise the position of the particles. Figure 4

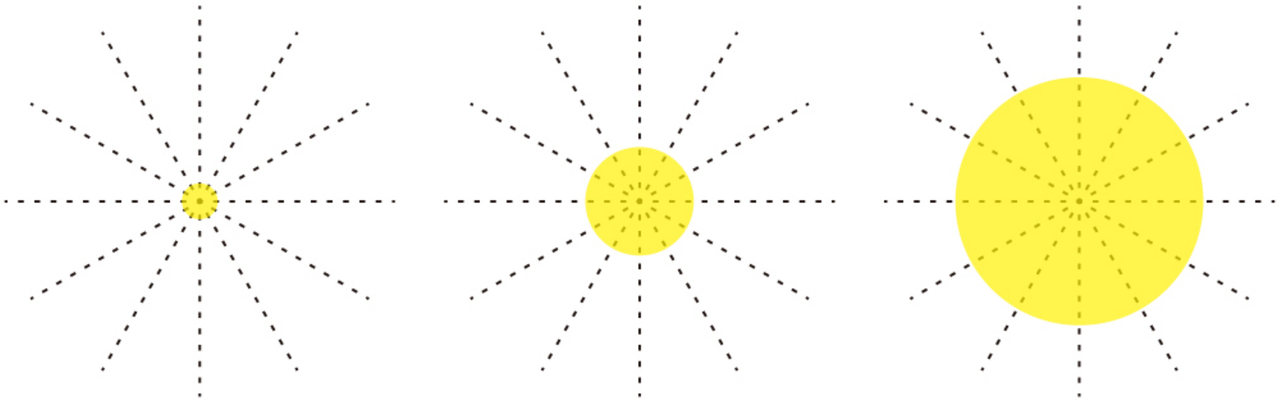


figure 4 the lower the density, the larger the size

3 Quantum Entanglement

It can be seen from D-P that any two particles are always in contact with each other. Therefore, it is understandable that the two particles interact in some way. Figure 5

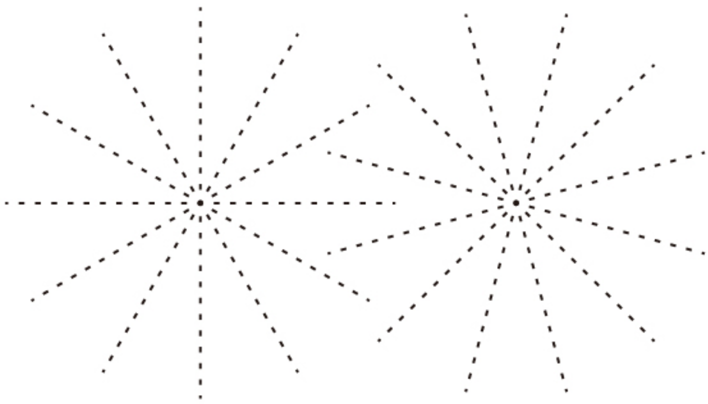
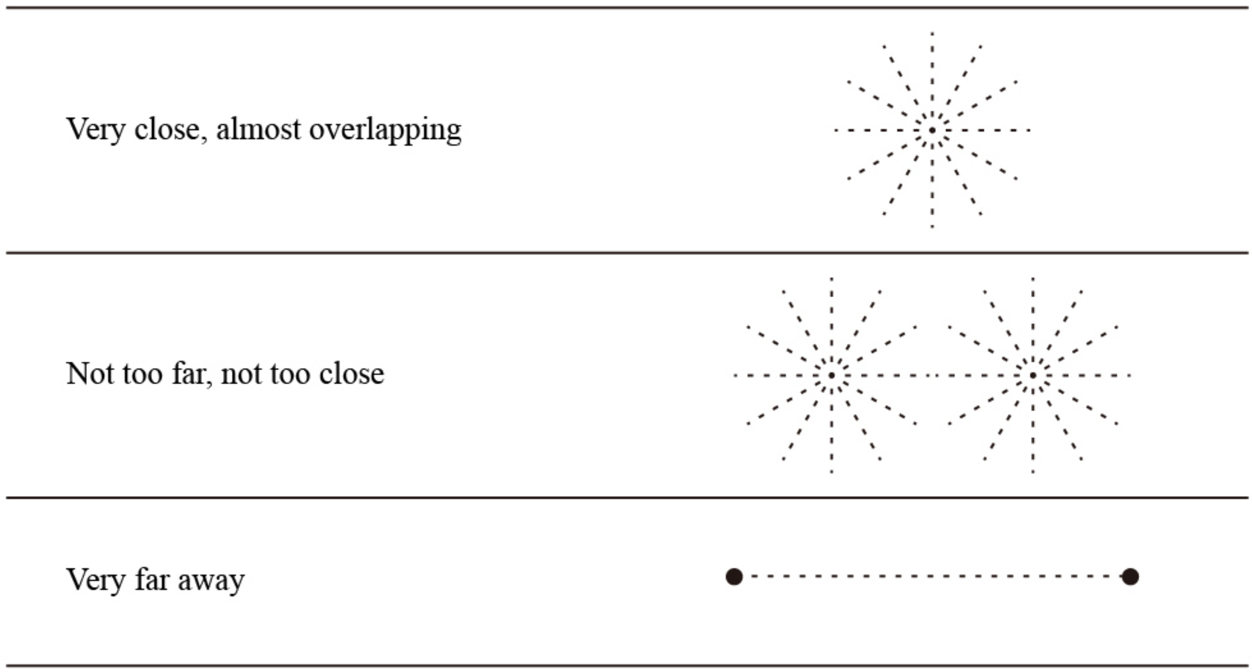


figure 5 Any two particles always come into contact with each other

We believe that Pauli exclusion principle and quantum entanglement are the same in nature.

4 Gravitation

We believe that gravity is a trend of diffusion from high density to low density. Because the branches in each direction cancel each other out, the direction of gravity finally points to the other's center of mass. In general, the gravity between two particles can be divided into three situations: they are very far away, or very close, or between very far and very close. Figure 6 figure 6 Three states between two particles



Obviously, the maximum value of gravity appears in an intermediate region, between very far and very close. In addition, because the density distribution of particles is uneven and the radius of particles is infinite, we can regard particles as a multi-layer sphere nested structure, so gravity is the result of the superposition of multiple systems. That is to say, each scale has its own gravitational system, and the final gravity is generated by the gravitational system of all scales. The gravitational system of each scale plays the most important role in its own scale, and the gravitational system of other scales approaches zero in this scale.

Obviously, at the macro scale, it is mainly the gravitational system at the macro scale, while the gravitational system at the subatomic scale has little effect at the macro scale. Similarly, the gravitational system on the macro scale has little effect on the subatomic scale. This is why gravity disappears at the micro scale. In fact, gravity does not disappear, but the performance of the gravitational system on the subatomic scale is different from that on the macro scale.

Obviously, the gravitational system on the subatomic scale has the following characteristics:
(1) The action distance is very close.
(2) Gravity is very strong.
The reason of strong gravitation on the subatomic scale: the density of subatomic part of a particle is much higher than that of the macroscopic part, and D-R tells us that density is positively correlated with the intensity of interaction. Therefore, we believe that the strong force is the gravitation on the subatomic scale.

5 Dark matter
After the above discussion, we believe that dark matter is the embodiment of the gravitational system on the macro scale. The focus is on the scale of gravity. In other words, it is necessary to clarify which scale of gravity system plays a major role. Obviously, the starting point of the scale range of dark matter is probably the galaxy scale, so we can hardly feel dark matter in the solar system.

As for dark matter, we will focus on one thing: the collision of bullet galaxy clusters. Bullet galaxy clusters provide important evidence for dark matter theory. But it also leads the dark matter theory in the wrong direction: Some researchers believe that the observation results of bullet galaxy clusters show that dark matter and the main mass of galaxy clusters have separated. We believe that dark matter does not separate from the main mass of galaxy clusters. According to our definition of dark matter, dark matter and baryonic matter are a whole, and they are inseparable. The separation between dark matter and the main mass in the observation results is just an illusion.

Because dark matter is observed indirectly through a gravitational lens, only the "observable" gravitational lens effect can be observed. In other words, if the effect of gravitational lens is weak or destroyed, it cannot be observed. Bullet galaxy clusters include both observable and unobservable gravitational lens effects. The observable part includes complete star clusters on both sides, which are hardly affected by the collision, so their gravitational lens effect is very good. The unobservable part is the collision plasma in the middle. The violent collision causes complex shapes and destroys the effect of the gravitational lens. 图 7

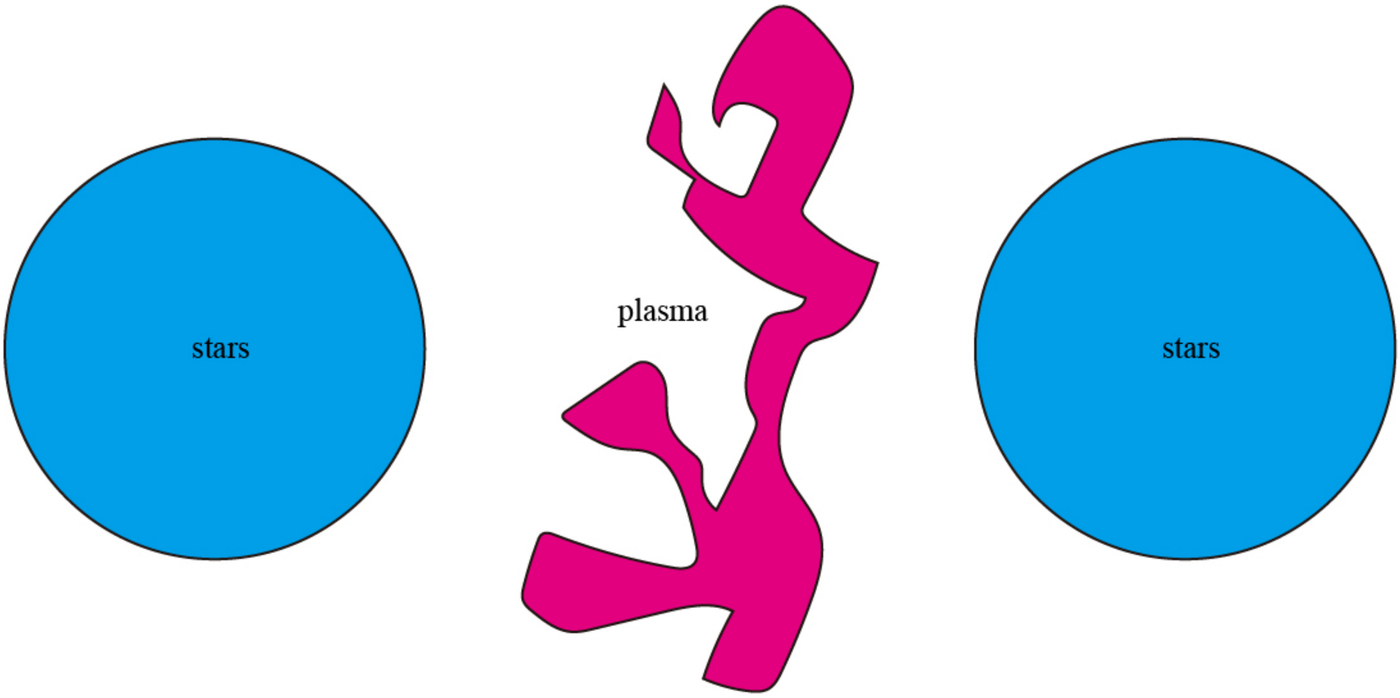


figure 7 Complete gravitational lens and broken gravitational lens