Dark matter fluid explanation for anomalies in Voyager 1 control data

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Abstract
On May 18, NASA announced that the data of attitude control system sent back by Voyager 1 was abnormal. It is not yet clear what the cause of this anomalous problem is. I did some simple analysis here. It is thought that the anomaly may be due to interference from cosmic rays, causing problems when the data is sent back to Earth. In addition, I also analyze from the dark matter fluid model. It is also believed that there may be space-time anomalies at the edge of the solar system's heliosphere, causing the spacecraft to frequently adjust its attitude according to the curvature of space-time. But the whole process did not find any problems with the actual spacecraft attitude on Earth. If it is because of the dark matter fluid, it is likely that we will lose contact with Voyager 1 in the near future. However, neither of these two hypotheses seems to have very solid theoretical evidence, and most of them are guesses. Therefore, further information needs to be confirmed by Voyager 2.

On May 18, NASA's Voyager 1 project issued an announcement [1], which confirmed that there were some problems with the data transmitted by Voyager 1's Attitude Articulation and Control System (AACS). This problem is mainly manifested in that the control data sent over are all wrong, but the actual situation is that the antenna of Voyager 1 is accurately aimed at the earth. This can be confirmed by receiving Voyager 1's signal strength, signal-to-noise ratio, etc. from the ground station.

There is no theoretical explanation for this anomaly yet.

From the news release issued by NASA, we can see that there is a problem with the data during the control period, which is described in the NASA news release as "the data may appear to be randomly generated" [1].

Although we cannot obtain specific data from NASA, from the description of this news release, we can still see some important characteristics of these abnormal data. The first thing that was emphasized in the press release was "may appear", which means that NASA is not yet very sure that this abnormal data is random. That is to say, it may also be a systematic error. Secondly, it also shows that the change of this control data problem is relatively slow. It is precisely because the abnormal data changes slowly that NASA cannot obtain enough data to prove that these abnormal data appear randomly.

According to this analysis, we can roughly determine the reasons that affect the abnormal data of

the controller, and there may be such three aspects.

The first problem could be a sensor problem. That is to say, if the data sensed by the sensor is wrong, for example, the signal sent from the earth is weakened, it means that the attitude of the antenna or the spacecraft needs to be adjusted in order to re-align the earth. This process is clearly closed loop. Since it is a closed-loop process, it means that if the data sent by the sensor is wrong, the attitude of the natural spacecraft or the direction of the antenna will also be adjusted incorrectly, resulting in the spacecraft and the earth eventually losing contact. But the actual situation is that the current attitude and antenna direction of the spacecraft are undoubtedly correct from the point of view of the relevant parameters of the signal received from the spacecraft so far from the earth. Moreover, the transmitted signal is also very strong. As long as the spacecraft does not adjust its current attitude, the signal receiving station on the ground will be able to continue to receive various data signals from the spacecraft normally.

2nd question. Since the first possibility has been ruled out, that is to say at least there is no problem in the closed-loop control of the sensor to adjust the attitude of the spacecraft or the direction of the antenna, then it is possible that the data from the sensor is transmitted to the information processing system of the spacecraft, and then there was a problem with the information processing system sending this data back to Earth. If it is the current digital computer, such a problem will obviously not occur, because once the digital signal interferes, all subsequent signal processing will have problems, and the transmission to the earth will also be garbled. However, in the 1970s, there was no such advanced microcomputer technology as we are now, so the processed signals are expected to be basically analog signals. Since the analog signal received from the sensor is then sent back to Earth through the spacecraft's analog signal processing system, the analog signal may be interfered with by cosmic rays, sending erroneous data back to Earth. So the possibility exists.

The third possible problem is the analysis result of this paper. In previous articles [2], I have analyzed the fluid model of dark matter. The entire universe is composed of a large number of dark matter fluids, and if the dark matter fluids are disturbed or flow too fast or the viscosity coefficient changes, etc., turbulence may occur. And this turbulence is the matter and energy we see in the universe. The stars in the solar system, i.e., the sun, and the planets orbiting the sun are all visible matter. In addition, the nuclear fusion energy of the sun and solar radiation are all visible energy. So these can all be seen as turbulent flows of dark matter fluids.

In NASA's scientific popularization articles [3,4], a very vivid simulation is given, that is, the water flow in the pool is used to simulate the solar wind. As shown in Figure 1. In the picture, when the water from the faucet drips to the bottom of the pool, the water will spread quickly at this time. In the process of rapid diffusion of water flow, it is equivalent to the solar wind running at supersonic speed in the solar system. However, in this simulated figure, we can also see a very interesting phenomenon, that is, when the water flow spreads to a certain distance, the speed of the water flow will suddenly slow down. And a very clear boundary is formed between the water flow and the surrounding slow or even stationary water flow. This boundary is actually a turbulent phenomenon because the speed of the water flow changes too fast. This is called the "turbulent layer" in the figure. As shown in the dashed box in the figure.

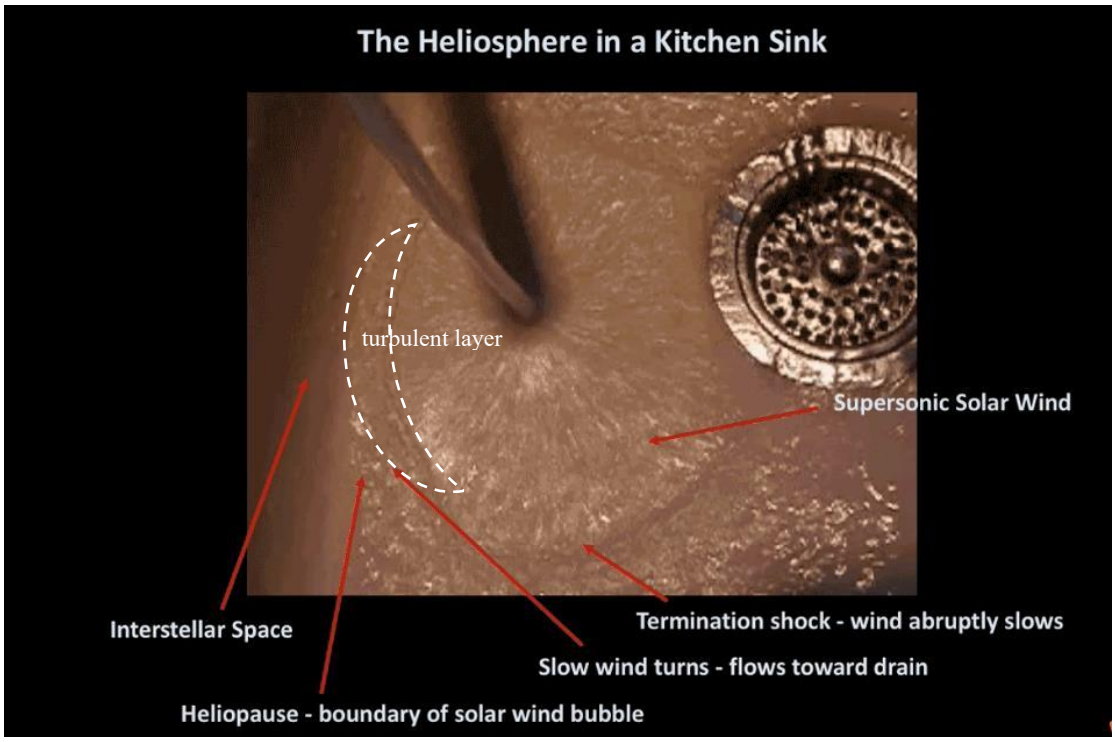

Figure 1. Simulating the heliosphere with a pool

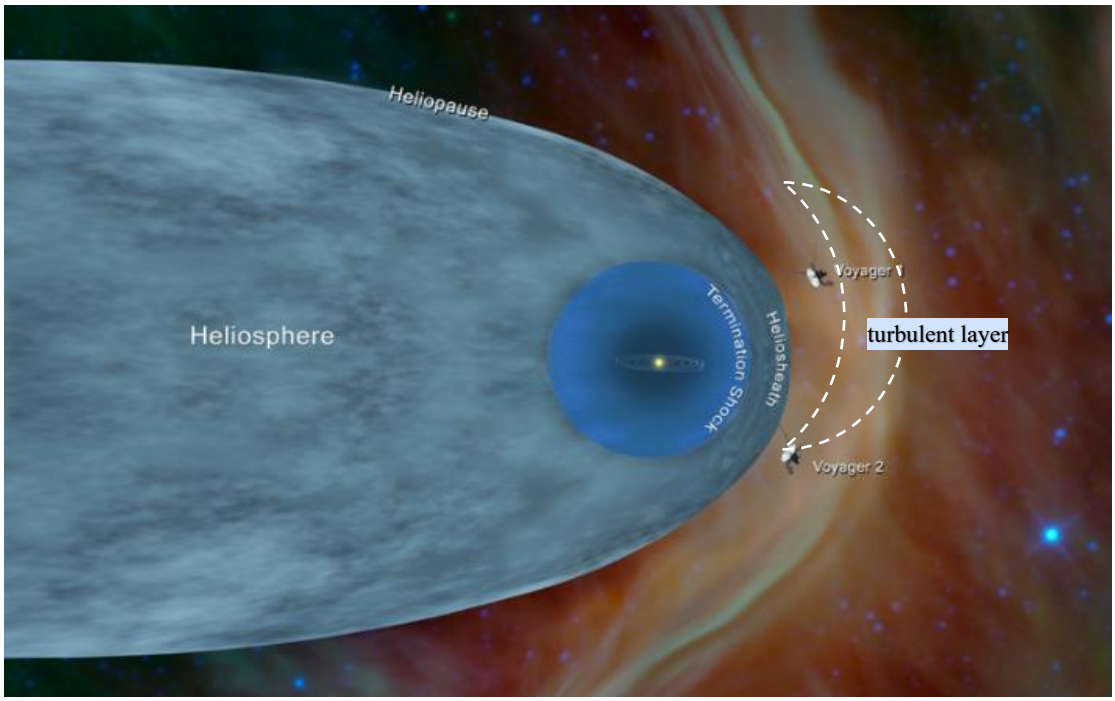

Figure 2. Voyager and the heliosphere

In Fig. 1, this turbulent boundary formed by the water flow boundary corresponds to the actual solar heliosphere boundary in Fig. 2. There is also such a turbulent layer at the boundary of the sun's

heliosphere, which corresponds to the dashed box in Figure 2.

Of course, the formation of this turbulent flow of the solar wind is actually related to the location of the dark matter fluid in the entire solar system. This turbulent layer formed by the solar wind at the boundary. It will also cause the change of the flow properties of the dark matter fluid, which will directly change the space-time characteristics formed by the dark matter fluid in this part.

That is to say, at the edge of the solar heliosphere, its space-time characteristics are very different from those inside the solar system and outside the solar system. Since the turbulence formed by this solar wind is very random, a relatively random space-time bending phenomenon may occur in this part of the space-time.

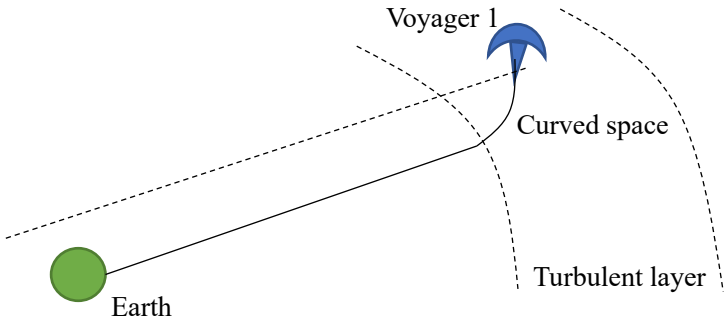

Figure 3. The effect of curved spacetime on the direction of the Voyager 1 antenna

As can be seen from Figure 3, if space-time bending occurs in the turbulent layer at the edge of the solar heliosphere, it may cause Voyager 1 to adjust the flight attitude and the direction of the antenna, so as to obtain the strongest communication with the earth.

Since the turbulence in the turbulent layer is very random, the curvature of spacetime created by this turbulence can also be very random. This causes the spacecraft to constantly adjust its controller data, allowing the spacecraft to always maintain the strongest signal connection to Earth's ground equipment.

This possibility can also explain why the control data of the spacecraft is abnormal, but the direction of the ground communication equipment aimed at the earth is always in the correct direction.

Considering that the space-time bending phenomenon in the turbulent layer after passing through the turbulent layer is still random. It is believed that such data anomalies will always exist during the subsequent journey of Voyager 1. Of course, if Voyager 1 is far away from this turbulent layer, it may be magnified due to the space-time bending problem of the turbulent layer, so that the communication between Voyager 1 and the earth will be lost. In this case, it may be time for us to say goodbye to Voyager 1!

In addition, consider that Voyager 2 is also about to enter this turbulent layer. Therefore, whether this controller data anomaly occurs in Voyager 2 is an important evidence to test whether the hypothesis in this paper is correct.

That is to say, after about another 9 months, if the same controller data anomaly occurs on Voyager 2, the model of this paper can basically be confirmed to be correct.

References

[1] https://www.nasa.gov/feature/jpl/engineers-investigating-nasa-s-voyager-1-telemetry-data

[2] Cheng, Z. A Fluid Model of Dark Matter. https://vixra.org/abs/2205.0018

[3] https://www.nasa.gov/feature/goddard/2021/studying-the-edge-of-the-sun-s-magnetic-bubble

[4] https://www.jpl.nasa.gov/edu/news/2017/8/29/the-farthest-operating-spacecraft-voyagers-1-and-2-still-exploring-40-years-later/