The analysis of FRB 180916.J0158 + 65 that may be a signal of extraterrestrial civilization

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Abstract: Some time ago I pointed out that radio telescopes in the North Pole of the Earth are most likely to find information transmitted by advanced extraterrestrial civilizations. Reading the news recently, I noticed that the Canadian CHIME telescope has obtained repeated fast radio burst (FRB) signals in the past few years. The FRB 180916.J0158 + 65 detected in September 2018 has a very fixed 16-day oscillation mode. From the results of CHIME Collaboration analysis, this FRB signal is from a spiral galaxy 0.03 redshift outside the Milky Way. However, the results of my analysis also show that the signal is actually highly likely to come from the interior of the Milky Way, even stellar systems that are very close to the solar system. If the signal comes from the inside of the Milky Way, the energy required to propagate it to the solar system does not need to be so large, so it is likely that it is a signal transmitted by extraterrestrial civilizations, and it will carry a lot of extraterrestrial civilization information. It is worth our in-depth study. This article also puts forward some suggestions for improving the CHIME telescope.

Keywords: FBR; CHIME; extraterrestrial civilization

1 Introduction

It is generally believed that Fast radio burst (FRB) originates from the circular motion of pulsars or the burst of supernovae. Because these radio signals are generally several GHz, the lowest can even reach several hundred MHz, which is similar to the ground Wifi signal. Therefore, such signals are easily affected by the cosmic environment and change the propagation path. This can be confirmed by the fact that FRBs measured on the ground usually have a certain chance. Since the direction of this type of microwave signal is easy to change, unlike the very high frequency light propagation characteristics, it is very difficult to determine the source of the microwave signal. Therefore, this type of signal can usually only be measured once, and then the direction changed and could no longer be measured by radio telescopes on earth. This phenomenon is more likely to occur for FRB signals origin from galaxies that are very far away from earth. Due to the contingency of the signals, these signals are not very useful for analyzing extraterrestrial civilizations. However, in recent years, some observatory radio telescopes have measured FRB signals transmitted at repetitive periods. The regularity of these signals may have a great relationship with signals from extraterrestrial civilizations, which deserves attention and careful analysis.

Among them, the FRB 180916.J0158 + 65 signal observed by the Canadian CHIME Observatory is a typical case [1, 2]. This signal has been continuously received by the CHIME telescope since it

was observed in September 2018. And it has a very stable cycle of 16.35 days. There are various views on the origin of the FRB 180916.J0158 + 65 signal. CHIME Collaboration believes that the signal was generated by a spiral galaxy outside the Milky Way. The spiral galaxy is about 500 million light-years from Earth [1]. For the cause of this signal, many authors have given their own models. Some authors believe that the signal was generated by a neutron star [3], while others believe that the signal was generated by a magnetic star [4]. However, the evidence supporting these views is not sufficient [1]. Therefore, it is necessary to further explore it.

In terms of the location of extraterrestrial civilizations, the center of the galaxy was generally considered to be a huge black hole, and the stellar system in the periphery of the galaxy is a fixed elliptical movement around the center of the galaxy. This makes it difficult to tell which stellar systems are older and which are younger. If there are older stellar systems, it means that planets suitable for biological evolution in this system are more likely to evolve from extraterrestrial civilizations. Some time ago, I used a new white hole model to analyze the spiral structure of the Milky Way, and thought that the center of the Milky Way was a white hole [5, 6]. This means that the center of the Milky Way will continuously eject masses, which will cause the ages of the inner and outer stellar systems to be different. Usually the planets in the outer Milky Way are older, and the center of Milky Way is constantly generating a large number of new stellar systems. The calculation results are basically consistent with the evolutionary process of the earth's biology [6, 7].

Such calculation results also show that on the galactic disk, it is easier to receive microwave signals transmitted by extraterrestrial civilizations in the Milky Way that are more advanced than earth civilizations toward the north pole of the earth [8].

The location of the CHIME radio telescope in Canada meets this requirement. Since the completion of the construction of the CHIME telescope, it has received a number of fast radio bursts came from space. Many of these are FRB signals with a fixed period. At present, a special FRB 180916.J0158 + 65 signal caught my attention. The signal is located in the direction of the galactic disk, and it can be received for up to one year, which means that the signal will not be too far away from the earth. This is analyzed in detail later in this article. Comprehensive analysis of various factors shows that the signal is likely to be related to advanced extraterrestrial civilizations. If we can conduct an in-depth analysis of this signal, we may be able to obtain some important information about the existence of extraterrestrial civilizations.

2 Where CHIME Telescope is

Compared to the location of the Greenland telescope, CHIME Telescope is located at a slightly lower longitude. Of course, it can basically face the North Pole in the earth.

As shown in Figure 1.

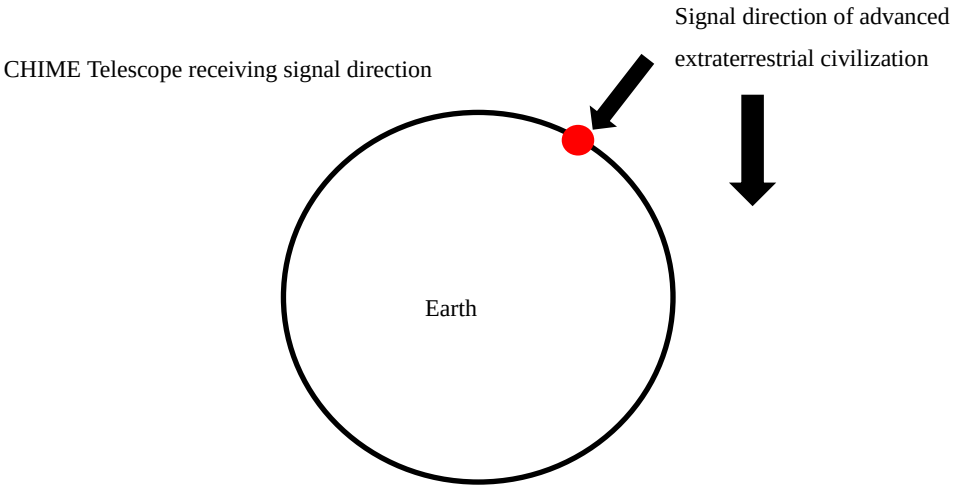

Figure 1. The location of CHIME Telescope

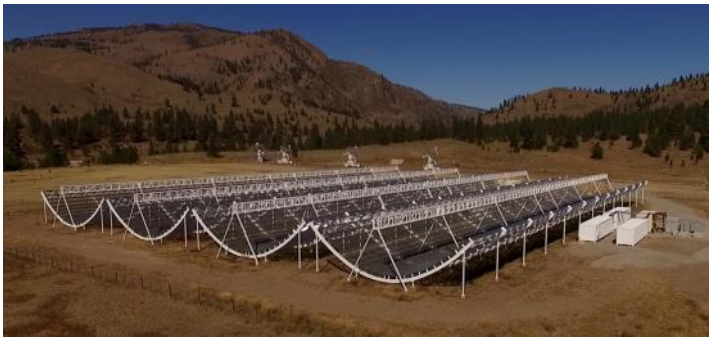

Figure 2. CHIME Telescope (https://chime-experiment.ca/)

3 FRB 180916.J0158 + 65 signal is likely to come from inside the galaxy

It can also be seen from Figure 2 that the direction of the CHIME Telescope is fixed, and Figure 3 shows the distance of the signal source from the earth. If the signal source is 500 million light-years away from the earth, even a very subtle interference will cause the direction of the signal to change greatly. Especially the earth itself is already a very small target, so the probability of distant microwave signals reaching the earth is very small. This is why the FRB signals observed over the past ten years are one-time. And if it is assumed that the signal source emits a spherical wave, it means that the signal source needs a very large amount of energy to enable the signal to be detected by the earth.

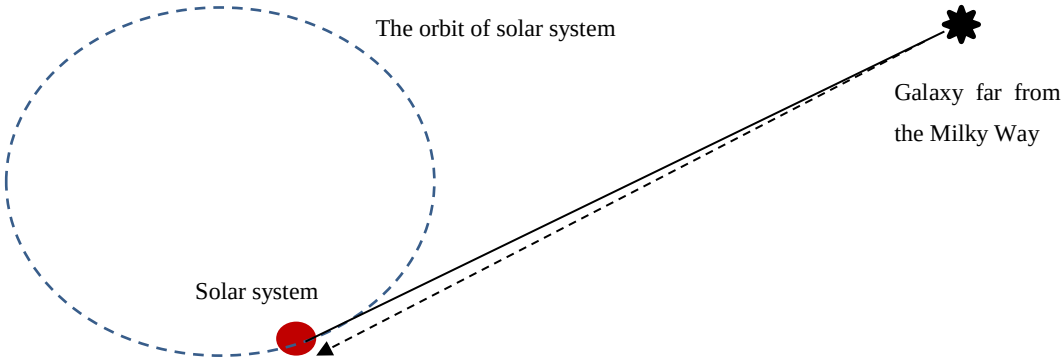

Figure 3. Tiny offset makes it impossible for FRB signals to reach Earth repeatedly

Therefore, if the same FRB signal can be detected for up to one year, it can also prove that the signal source is most likely inside the Milky Way and is closer to the solar system. The current periodicity shown by FRB 180916.J0158 + 65 reflects that the FRB has not been greatly disturbed when it is transmitted to the earth, enabling it to be emitted to the earth in a continuously fixed direction.

It is worth noting that the direction of the FRB 180916.J0158 + 65 signal source has been confirmed to be consistent with the disk plane of the Milky Way, which also means that if the signal is a signal emitted by other galaxies outside the Milky Way, it will be easily affected by matter in the Milky Way. Because this FRB signal also has a very low measured DM (dispersion measures) excess, which is similar to other microwave signals in the galaxy, it also made CHIME Collaboration once suspect that the signal may come from the inside of the galaxy [1]. CHIME Collaboration researchers also did not find any supernova or gamma-ray source bursts in the hypothetical host galaxy region. Therefore, it is not appropriate to explain the FRB phenomenon with a magnetar model.

The duty cycle of the entire signal is very small. That is to say, there is no signal most of the time in a period of signal transmission. The duration of each received signal is only a dozen milliseconds. This is a very narrow pulse signal. Radio signals generated by electromagnetic motion in the universe, such as microwave signals generated by the rotation of magnetars, are usually relatively continuous, that is, they can be continuously received for a period of time. In other words, there are already various galaxy models that can generate radio wave signals, but it is difficult to explain how fixed-cycle and narrow bandwidth radio wave signals such as FRB 180916.J0158 + 65 are generated.

And if this signal is regarded as the radiation of the pulsar, the calculation results show that it takes a pulsar several million times brighter than the maximum brightness pulsar we now know to be able to produce such a powerful FRB signal. This is also a phenomenon that is difficult to explain by existing cosmological theories.

At present, the method of measuring the position of the FRB signal source is usually the

interference method. However, for microwave signals whose directions are easily shifted, the accuracy of this method is questionable. At the same time, the diameter of the earth is too small relative to the distance of hundreds of millions of light years. It is questionable whether interferometry can also be used to determine the location of the signal source.

4 FRB 180916.J0158 + 65 signal characteristics

The FRB signal that has been detected is only a few tens of milliseconds. Its frequency is about 1GHz, and the lowest reaches about 400MHz. This is basically the same as the frequency of ground microwave signals.

For a signal that lasts for ten milliseconds at a frequency of 1 GHz, there are approximately $10^9 \times 10^{-2} = 10^7$ cycles. If one cycle can carry one bit of information, a ten millisecond FRB pulse signal can carry about ten million bits of information. It can be seen that the amount of information in this signal is still very large.

Of course, if extraterrestrial civilizations do need the earth to be able to identify the information contained in them, most of these signals should not use compression technology. The simplest is to use an uncompressed image pixel signal. If an 8-bit grayscale signal is used, a grayscale image of one million pixels should be sent per FRB signal period. This definition is still relatively high, and can convey some very important information.

After transmitting some basic information, the microwave signals emitted by extraterrestrial civilizations can contain more information to guide the earth to receive compressed data, so that the earth can receive complete information about extraterrestrial civilizations.

Of course, if the purpose of the information transmitted by extraterrestrial civilizations is to promote the evolution of life on Earth, then this information should be powerful enough to affect the genetic structure of living things, such as changes in the genetic structure of single-celled organisms. This involves the knowledge of life sciences, which needs further analysis and discussion.

Because the CHIME Observatory does not provide the complete waveform of the FRB 180916.J0158 + 65 signal, this article can only roughly estimate some important characteristics of the FRB 180916.J0158 + 65 signal from published papers.

First, in the time range of 400 days, a variety of FRBs signals with different periods are superimposed, and the signal period covers different times from 1.57 to 62.8 days, and the period of the active signal appears at 16.35 ± 0.18 days.

Second, the signal has a bandwidth of about 118 MHz, which means that the signal may be some

kind of modulation signal. That is, a signal of more than a hundred MHz is superimposed on a fundamental frequency. The modulated signal can carry about one million bits of data information. The modulation methods we currently know are mainly three methods: amplitude modulation, frequency modulation and phase modulation. Because the amplitude modulation signal is very unstable, if it is a signal transmitted by an extraterrestrial civilization, it is very likely to use both frequency modulation and phase modulation. The frequency modulation method is more suitable for the transmission of analog signals, while the phase modulation signal is more suitable for the transmission of digital signals. Considering that we do not yet know how extraterrestrial civilizations encrypt digital signals, FRB 180916.J0158 + 65 may carry both frequency-modulated and phase-modulated signals. The FM analog signal may be used to propagate the most basic identification information and some digital signal encryption algorithms. The main information should be included in the phase-modulated signal.

Third, from the overall signal perspective, the pulse width is very narrow, that is, the duty cycle is small. This periodicity also contains certain information in it. That may be to show us that this is an unnaturally generated signal, and let us make clear that this is a radio signal directly transmitted by a highly developed extraterrestrial civilization. In addition, in order for these signals to be received by the earth and other civilizations, pulses with a small duty cycle are used for transmission, which can save the energy of the transmission and facilitate the long-term transmission in different directions in space. From here, we can also guess that extraterrestrial civilizations are not clear about the progress of earth civilization, but instead use continuous scanning around a circle to continuously emit microwave signals on the Galactic disk of the Milky Way. And complete a cycle every sixteen days.

This is the result of data analysis based on published formal and preprinted papers. The specific signal content and how to analyze the signal need to obtain a complete waveform signal. Of course, due to the limitation of the sensitivity of the radio astronomy telescope itself, it is very difficult to obtain a high-definition and complete waveform. Therefore, after confirming that the radio signal does carry information about extraterrestrial civilizations, the CHIME telescope can be appropriately improved, such as increasing the telescope receiving area, adjusting the telescope focus direction and so on. In addition to hardware improvement measures, in terms of management, we can also consider introducing specialists in signal analysis to analyze some important information carried from the existing information.

5 Summary

From my past work and analysis of this article, extraterrestrial civilization must exist. The earth is not a very special planet in the Milky Way, which also means that there must be a lot of extraterrestrial civilizations in the Milky Way that are more advanced than the Earth ’s civilization. In this case, as an important tool for transmitting information in the civilized world: radio waves will also be used by various advanced extraterrestrial civilizations to communicate with other civilized worlds. From this we can conclude that the radio signals of extraterrestrial civilizations that can be transmitted to the earth are ubiquitous. It is only because the radio technology used for

astronomical observation on the earth is immature, so we often ignore those radio signals that carry rich information about extraterrestrial civilizations.

Of course, in addition to technical reasons, another cultural prejudice may also cause us to turn a blind eye to signals of extraterrestrial civilizations. This cultural prejudice may be derived from the influence of the Earth's centralism in the past. It is believed that mankind was created by God and is the only wisdom in the universe. Therefore, even if there is very obvious evidence, many people choose to ignore its existence and try to explain it for other reasons. This will cost us many important opportunities to learn about a more advanced civilized world.

At present, the FRB 180916.J0158 + 65 signal has some very important characteristics. These characteristics show that it is a manually manufactured signal. This is mainly reflected in its stable periodicity. In addition, its propagation is also in the direction of the Galactic disk, which means that in all stellar systems covered by the direction of the Milky Way disk, there may be the possibility of transmitting the radio signal to the Earth.

According to the analysis of my white hole model [5~8], the propagation direction of FRB 180916.J0158 + 65 is exactly the direction in which advanced extraterrestrial civilization may exist, and it is the best direction for receiving advanced extraterrestrial civilization on earth.

If the signal is indeed a signal transmitted by an advanced extraterrestrial civilization, we suggest that we can now do the following:

1. The CHIME Observatory should provide the complete waveform data of the FRB 180916.J0158 + 65 signal downloadable as soon as possible, so that the interested researchers who have the technical analysis capabilities in the world can analyze the waveform effectively. I believe that the wisdom of the crowd around the world must be more productive than the research of a few astronomers.

2. Adjust the focusing direction of the CHIME radio telescope. This makes it possible to face the direction transmitted by the FRB 180916.J0158 + 65 signal source.

3. Expand the area of the CHIME radio telescope, so that it can obtain higher-definition FRB signal data.

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