Super distance communication with Quantum Entanglement

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Abstract:Super distance communication with quantum packet selection and grouping plus interval correction

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According to the nature of the quantum entanglement we have now determined, the following method can be used to achieve the super distance communication based on light years distance.

This method can be called a packet selection plus interval correction method. The quantum in the entanglement is in the superimposed rotational state, and if it is observed, it becomes the rotational state, left rotation or right rotation. At first I would like to introduce some of the necessary concepts. First the side who send the message first will be called the originator, the side who receive the message will be called the receiver.Then we know,the quantum in the entanglement is paired ,which include 2 light quantum, which is called 1 pair of quantum.For this paired quantum,the originator and receiver must keep 1 light quantum respectively for communication.

The first step is to group the light quantum, 2 pairs of entangled quantum constitute a group,so the group include 4 light quantum. Such a group in the originator and receiver, respectively, there are 2 light quantum for each side. If you observe this group of quantum, then the two sides have the three following possible results: double left rotation, double right rotation, left and right rotation. For the sake of convenience we compiled them as AA(double left rotation), BB(double right rotation), AB(left and right rotation).The second step will be compiled for each of the three groups of quantum,we call the 3 groups as a round. For the observation of a round,the originator and receiver will observe 6 light quantum respectively.The result for each round will be like this:AA,BB,AB or AB,BA,AB etc.This observation of a round, you may have a variety of results. We will set two of these results as valid results,named valid round. One is the round of the emergence of two AA combination named dual AA, the other is the round of the emergence of a combination of two BB named dual BB. Therefore,we got the following 6 valid round,they are:AA, AB, AA and AB, AA, AA, and AA, AA, AB ; the same way BB, BB, AB and BB, AB, BB and AB, BB, BB. In addition to the 6 valid combinations above, the rest are invalid combinations, named invalid round. For example: AB, AA, AB or AB, AB, BB and so on. In addition, such as AA, AA, AA and BB, BB, BB there are three AA or 3 BB, also invalid round. Invalid rounds both by default, means this round of observation consist no information and should be ignored.In the third step, there are three sets of quantum in turn. For example, AB, AA, AA this valid round, the first group of AB combination we named as invalid group.The AA and BB we named valid group. Note that a valid round must have and only have a group of AB, that is to say,an invalid group. A valid round consists of a set of invalid

group AB plus two valid groups of AA or BB. It is necessary for us to find the invalid group AB when we analyze a valid round.We must determine the sequence order of an invalid group of AB.Which is to say, whether the AB combination is appeared in the first order, second order or third order in this round. Such as AB, AA, AA in this round ,the invalid AB's sequence order is 1; AA, AB, AA this round ,the invalid AB's sequence order is 2; AA, AA, AB this round ,the invalid AB's sequence order is 3.
Some of the basic concepts described above are completed. Now suppose that a spacecraft is starting from the earth, after many years, this spacecraft is 1000 light years away from us. We must communicate with this spacecraft. We will set the spacecraft as originator, which is the first party to send information, the Earth side as the receiver. This setting is necessary, otherwise it will lead to chaos.For the communication between the originator and the receiver (that is, the spacecraft and the earth) to proceed smoothly,we must meet the following conditions.

First, before departure, the two sides agreed to the specific frequency of communication with each other, this specific time is very important to be accurate to the second. For example, to determine the two sides a communication time each year, the time is in January each year, zero o'clock, that is, 00:00:00, zero minutes and seconds.Odd year,the spacecraft play as originator. Even year the Earth play as originator. The two sides to carry out such a specific frequency of communication and specific time setting is necessary. We will name these pre-agreed communication days(00:00:00 in January) as fixed communication days.
In addition to such a fixed communication, by the two sides in each round of fixed communication agreed to a specific time for non-fixed communication. Note that each communication must be agreed in advance, this can not be changed.
Second, based on the above requirements, spacecraft and the Earth must have a unified time measurement system. Because the agreed time must be the Synchronized, otherwise the communication can not be carried out. Time to be accurate to the second, of course, now the technology has been able to achieve this.
Here we assume that the two sides have a unified timing of the time measurement system.
Third, the communication requirements for the communication of the quantum code grouping and sort order. Before departure, the spacecraft shall carry the quantum used for future communication, which must have been grouped and sort ordered. We assume that the spacecraft and the earth to carry out 10,000 communications, assuming that we are now in communication mode, each communication to consume about 30 million pairs of quantum, then 10,000 communications to be 3 billion pairs of quantum. The 3 billion pairs (6 billion light quantum) must be coded and sort ordered.Before the departure,the Earth and spacecraft carrying 3 billion light quantum respectively. This quantum can not be added half-way.

How to sort the 30 billion quantum code? This is a very important procedure.

Communication ten thousand times, then each time to be 300,000 pairs of quantum, each time the 300,000 pairs of quantum to be separated and from 1 to 10000. Each 30 million pairs of quantum is set to a communication round. If the number of 30 million quantum is lost for a big amount, then this round of communication can not be carried out, but does not affect the other round of communication. Why 30 million quantum for a round,because of the communication mode I used. It is only the beginning to encode every 30 million quantum. Now I need to introduce the communication mode, because all the coding sort depends on the communication mode. We said above a group include two pairs of quantum, three groups constitute a round. Now set as this, every minute by the originator to observe a group of 2 light quantum first.Set this is the case, in this minute, the first 40 seconds by the originator to observe the 2 light quantum they have, the remaining 20 seconds by the receiver to observe 2 light quantum they have. For example, the agreed communication time, 00: 00: 00 both sides go to the communication room. 00:00:00 to 00:00:40 this time period for the originator to observe the 2 quantum they have, and record the results. And this time period, the receiver can not take action, can not observe their quantum. The receiver waits until 00:00:41 to 00:00:60, which is the time period that the receiver observes the 2 light quantum they have and records the results. This is the process of a minute. As mentioned earlier, a round consist 3 groups of quantum, it takes 3 minutes, consuming 6 pairs of quantum(12 separate light quantum). After each round of observation, we set an interval, rest for a few minutes.
Now we need to handle the sequence order of the invalid group AB.After each round of observation, we set an interval.For an invalid round we set the interval of 1 minute.For the valid round we set the interval depend on the sequence order of the invalid group of AB. We set the interval as:sequence order NO.+1 minute. For example:the valid round AA, AB, AA,the sequence order NO. Is 2,then we got an interval of 2+1 minutes.That is to say, after the current round of observation the originator will wait 3 minutes before observing the next round. Why should we set such an interval? This is to exclude the impact of random factors. As this round, the originator observed the result as AA, AB, AA, then the receiver will observe the result as BB, AB, BB. So the receiver know AB appear in the sequence order 2, they can also calculate the interval is 2+1, the originator will rest for 3 minutes, their own side also have to wait 3 minutes to observe the next round.

So count as above, three minutes to observe the three groups of quantum plus a minute interval, normally a round takes 4 minutes.
Every hour can be carried out 15 rounds, every 2 hours 30 rounds. We set 30 rounds as a section. There are 30 rounds, to consume 180 pairs of quantum. In each of our section (2 hours) can send a BIT, that is, a 1 or 0, that is, 180 pairs of quantum to send a BIT.

Now, we set to send a section of information in the following order: 1. Dual AA, 2. Double BB, 3. Dual AA, 4. Dual AA, 5. Double BB. Now to the agreed communication time, such as Year 3XXX January 1 at zero o'clock. 00:00:00 both sides go to the

communication room. The communication process is as follows:
1.00: 00: 00 to 00:00:40 The originator observes that the two qubits of the local end are AB. 00:00:41 to 00:00:60 receiver to observe the end of the two quantum AB.
2.00: 01: 00 to 00:01:40 The originator observes that the two qubits of the local end are AB. 00:01:41 to 00:01:60 Receiver to observe the end of the two quantum AB.
3.00: 02: 00 to 00:02:40 The originator observes that the two qubits of the local end are AA. 00:02:41 to 00:02:60 receiver to observe the end of the two quantum BB.
This completes the first round of three groups of observations, the originator results AB, AB, AA, the receiver results AB, AB, BB. Regardless of the originator or the receiver are aware of this round does not appear dual AA, so it's invalid round, the two sides to rest for 1 minute before starting again.
Now the new round starts:
1.00: 04: 00 to 00:04:40 The originator observes that the two qubits of the local end are BB. 00:04:41 to 00:04:60 receiver to observe the end of the two quantum AA.
2.00: 05: 00 to 00:05:40 The originator observes that the two qubits of the local end are AB. 00:05:41 to 00:05:60 receiver to observe the end of the two quantum AB.
3.00: 06: 00 to 00:06:40 The originator observes that the two qubits of the local end are BB. 00:06:41 to 00:06:60 receiver to observe the end of the two quantum AA.
This completes the observation of the second round of the three groups, the originator results BB, AB, BB, the recipient results AA, AB, AA. Regardless of the originator or the receiver are aware of this round of dual AA, so it is a valid round, the first two AA of this section has been sent to the receiver. And the sequence order NO.of the invalid AB is 2, so 1 +2 is equal to 3, both sides understand that the interval is 3 minutes. In accordance with the previously agreed order: 1. Dual AA, 2. Double BB, 3. Dual AA, 4. Dual AA, 5. Double BB, 6. Double BB. The next round, the originator need to send the double BB.
Let us start the new round:
1.00: 10: 00 to 00:10:40 The originator observes that the two qubits of the local end are AB. 00:10:41 to 00:10:60 receiver to observe the end of the two quantum AB.
2.00: 11: 00 to 00:11:40 The originator observes that the two qubits of the local end are AA. 00:11:41 to 00:11:60 receiver to observe the end of the two quantum BB
3.00: 12:00 to 00:12:40 The originator observes that the two qubits of the local end are AA. 00:12:41 to 00:12:60 receiver to observe the end of the two quantum BB.
This completes the observation of the third round of the 3 groups, the originator results AB, AA, AA, the receiver results AB, BB, BB. Regardless of the originator

or the receiver are aware of this round of double BB, so it is a valid round.The first two BB of this section has been sent to the receiver. And the sequence order NO.of the invalid AB is 1, so 1 +1 is equal to 2, both sides understand that the interval is 2 minutes. In accordance with the previously agreed order: 1. Dual AA, 2. Double BB, 3. Dual AA, 4. Dual AA, 5. Double BB, 6. Double BB. The next round, the originator need to send the dual AA.
Well, so far has been carried out three rounds, sent 1. double AA, 2. Double BB. We still need to send the remained 3. Dual AA, 4. Dual AA, 5. Double BB, 6. Double BB for a complete section.Basically the pattern of the process has come out, the following 3. double AA, 4. double AA, 5. double BB, 6. double BB could be sent as the above pattern.
We mentioned before that we set 2 hours as a section. 2 hours(120 minutes), it must be equipped with 180 pairs of quantum to prepare for a section communication. Now according to the above model in 2 hours we passed a valid message,that is: 1. Dual AA, 2. Double BB, 3. Dual AA, 4. Dual AA, 5. Double BB, 6. Double BB. Then what is the meaning of this message? The recipient received this message to understand that this message is not come from chaos. It was sent after human manual selection. In accordance with the binary code, this 2 hours of message can only be encoded as a 1 or a 0. For the time being we encode this human manual selection message as 1. Yes, that is so inefficient, one section(2 hours) can only send a 1 or a 0, But taking into account that this may be hundreds of thousands of light years between the transmission of information, this efficiency is also acceptable. Now we have encoded a binary 1, then how about the 0? Easy to handle, in the next 2 hours, At the beginning 40 seconds,the originator observe all the 180 quantum. That is, at Year 3XXX January 1, 02:00:00 to 02:00:40 the originator will observe all the 180 quantum in one time.So the receiver will realize:the message are chaos and could not be decoded.Then the chaos in these 2 hours we encoded as a 0.And then analogy can be followed by binary code to enter. Line information is transmitted, and this is the information transmission.
Conclusion: The model exemplified here is not necessarily optimal, and it is possible to make various changes. It is important that the idea of sending quantum packets and interval is decisive. Of course, can not rule out the future there are other more effective way.

以量子纠缠实现的超距通讯

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摘要:以分组择定加间隔修正法实现的超距通讯

关键词:量子分组 间隔发送 超距通讯 量子纠缠 量子通信

根据我们现在所确定的量子纠缠的特性，可以采用下述的方法来实现超距通讯。
这个方法可以称之为分组择定加间隔修正法。

纠缠中的量子是处于叠加的旋转状态的，如果被观测则会成为确定朝向的旋转状态，左旋或右旋。在此先介绍一下必要的一些概念。纠缠中的量子是成对的，这称为一对量子。
第一步先要将量子进行分组，2 对纠缠中的量子分为一组。这样一组中在发送方与接收方分别有 2 个量子，现在我们将发送方叫为发端，接收方叫为收端。如果观测一组量子的话收发两方有以下可能的结果：左左，右右，左右，右左，由于左右与右左在此是无法区分的，我们统一叫为左右。那就是左左，右右，左右三种结果，为了方便起见先编为 AA,BB,AB。
第二步还要将每三组量子编为一轮。这样观测一轮的话，可以有多种结果。我们将其中两种定为有效结果。一种是一轮中出现了 2 个 AA 的组合命名为双 AA，另一种是一轮中出现了 2 个 BB 的组合命名为双 BB。一轮中包括三组量子，至于 AA 与 BB 出现在一轮中的哪一组则无关紧要。我们将出现了双 AA 或双 BB 组合的这一轮命名为有效轮，比如：AA,AB,AA 或 AB,AA,AA,或 AA,AA,AB 皆为有效轮，同理 BB,BB,AB 或 BB,AB,BB 或 AB,BB,BB 皆为有效轮。除此两种有效组合外，其余皆为无效组合，命名为无效轮。比如：AB,AA,AB 或 AB,AB,BB 等。另外如 AA,AA,AA 和 BB,BB,BB 出现了 3 个 AA 或 3 个 BB，也为无效轮。无效轮双方默认无效，代表此轮略过不含信息。
第三步，有效轮中有三组依次排列的量子。比如 AB,AA,AA 这一有效轮中，第 1 组 AB 既非 AA 也非 BB，这个 AB 组合我们命名为由效轮中的无效组。因为他不属于 AA 或 BB 这种我们选定的有效组。注意，一个有效轮中必然有一组 AB，也就是无效组。一个有效轮由一组无效组 AB 加上两组 AA 或 BB 组成。我们找出这个无效组 AB 是必须的。然后还必须确定这个无效组 AB 在这一有效轮中的组序是多少，也就是在这一轮中 AB 组合是出现在第 1,2 还是第 3 组量子中。比如 AB,AA,AA 这一轮中 AB 的组序是 1；AA,AB,AA 这一轮中 AB 的组序是 2；AA,AA,AB 这一轮中 AB 的组序是 3，这个组序我们后面还要用到。

上面的一些基本概念阐述完毕。现在假设有一个宇宙飞船是由地球出发的，在 N 年后吧，这飞船距离我们 1000 光年。我们必须与此飞船进行通讯。我们将飞船定为发端，也就是先发信息的一方，地球端定为收端。这个设定是必须的，否则会引发混乱通讯无法进行。
发端与收端（也就是飞船与地球）的通讯要顺利进行，必须还要满足下面一些必要条件。毕竟是几百上千光年或更长的距离，通讯不是那么容易的。
一，出发前，双方要约定彼此通讯的具体频率与具体时间，这个时间非常重要，要精确到秒。比如确定双方每一年通讯一次，时间是在每年一月一号的零点正，也就是 00：00:00，零点零分零秒。奇数的年份，由飞船先发信息，然后地球再回信息。偶数年份由地球先发信息，然后飞船再回信息。当然这个约定的具体数值是可以根据情况由双方自由约定的，不一定非得一年一次，在一月一号零点正进行，这里是为了方便举例而做此设定的。但是双方进行这样的通讯的具体频率与具体时间的设定是必须的。我们将这些事先约定的通讯日命名为固定通讯日。除了这样的固定通讯外，也可由双方在每轮固定通讯时约定某个具体的时间进行非固定通讯。注意，每一次的通讯都必须事先约定才能进行，这个是无法更改的。
二，基于上面的要求，飞船与地球必需要有统一同步的时间计量系统。因为双方约定的时间必需是同一的，否则通讯自然无法进行。时间要精确到秒，当然现在的技术已经完全可以实现这个了。另外如果飞船方出现了时间混乱的话，也还是有办法与地球进行时间校准，也就是对时，但是这个确实非常麻烦，也不在本文论述的范围内。这里我们假定双方具有统一同步的时间计量系统这一条件是没有问题的。
三，通讯要求对用于通讯的量子进行编码分组并排列好。出发前，飞船要携带将来用来通讯的量子，这些量子必须已经编码分组并排列好。我们假定飞船与地球要进行一万次通讯，假设按照我们现在通讯模式下，每次通讯要消耗约 30 万对量子，那么一万次通讯需 30 亿对量子，当然量子是很小的，占不了多大的空间。这个看起来很巨大的数字，但是几百上千光年距离的通

讯，本来就是不容易的。这 30 亿对（60 亿个）必须要进行编码分组并排列好，出发前地球与飞船各携带 30 亿个。这个量子不能中途补充，也不能丢了，丢了或者用完了就无法通讯了。当然了，由于经过了编码并排序，丢了其中的一些会引起某些轮次的固定通讯无法进行，但没丢的依然可以进行通讯。

怎么对这 30 亿量子进行编码排序呢?这个是非常重要的必须程序，无此则不能通讯。通讯一万次，则每一次需 30 万对量子，每一次的这 30 万对量子要分开并从 1 编到 10000 号。每 30 万对量子设定为为一个通讯轮次。轮到哪一次通讯了，就动用哪一个编号的那 30 万量子，如果某个编号的 30 万量子丢失得比较严重，那此轮通讯就无法进行，但不影响其他轮次的通讯。为什么是 30 万量子一轮次呢，这个有本人我现在采用的通讯模式决定的。当然不排除未来会有更高效的模式，只需要极少的量子就可以了。

对每 30 万量子进行轮次编码还只是开始。30 万对量子内部还要进行再编码排序。但在此之前要先介绍一下通讯模式，因为所有的编码排序都取决于这个通讯模式。在这里，前面介绍的基本概念要起作用了。我们上面说了一组为 2 对量子，3 组为一轮。现在设定，每一分钟由信息发送方观测一组也就是 2 对量子，而信息接收方只能观查这 2 对量子的状态而不能决定它们的状态，所以用了观察这个词，而发送方用的是观测一词，请注意其中的区别。设定是这样的，在这一分钟里，前 40 秒由发送方观察本端的两个量子，后 20 秒由接收方观察本端的 2 个量子的状态。前面的对时就在这里起作用了，为什么要 00：00:00，零点零分零秒，并且要精确到秒？因为不如此则接收方不能确定自己现在是不是应该观察了。比如，约定通讯时间到了，00：00:00 双方都到了通讯室。00：00:00 到 00：00:40 这一时段发送方观察本端的两个量子，并记录结果。而这个时段，接收方是不能采取动作的，不能去观测本端的 2 个量子，一旦这样做了就干扰了发送方的观测，通讯无法进行。接收方等到了 00：00:41 这个时间，这是才是接收方观察量子状态的时间，并记录下结果。这就是这一分钟的流程。如前所述，一轮包括 3 组，则要耗时 3 分钟，消耗掉 6 对量子。每一轮观测后，我们设定有一个一分钟的间隔，休息一分钟，这个间隔的必要性后面详述，先做这样的设定。这样算的话，三分钟观测 3 组量子加上一分钟间隔，就算 4 分钟一轮。每一个小时可以进行 15 轮，每 2 小时 30 轮。我们将每 2 小时设定为一节。那么这一节中，有 30 轮，要消耗 180 对量子。在我们这个设定的模式中每一节（2 小时）可以传送一个 BIT，也就是一个 1 或 0，也就是 180 对量子传送一个 BIT。按 2 进制来算，一个汉字算 2 字节，16BIT。也就是说要 2880 对量子传输一个汉字，也就是说此模式下 16 小时才能传输一个汉字。是的，就是这么低效，2 小时才只能发一个 1 或一个 0，似乎非常低效和繁琐。但是考虑到这可能是几百几千光年之间的信息传输，这个效率也是可以接受的。而且如果时间可以更精确到毫秒或微秒级，也是可以变得更高效的，这里我们只是先做这样的设定。如上继续计算，传输 100 个汉字需要 288000 量子，取个整数，算 30 万，这就是 30 万个量子的来由。它可以传输 100 个汉字，要耗时 1600 小时。67 天，超过两个月。命名为一轮次的通讯。那么对 30 万量子的编码分组并排序就在此模式上进行。30 万量子由 1 号编到 30 万号，然后每 3 组编成一轮，共 10 万轮。由 1 轮编到 10 万轮。编号的同时必须要依次排序好，因为发送方观测时是要按顺序依次来的，从 1 号开始这样 2 号 3 号 4 号依次观测到到 30 万号。接收方也是要按顺序来的，从 1 号到 30 万号来观察，如果不按顺序来就无法通讯。

现在编码排序完了，通讯模式也基本介绍了，那么怎么具体通讯呢，为了更直观我们可以来模拟一下。在模拟之前我们还要解决一个问题，那就是每一轮（3 组量子）观测之间的间隔问题。前面说过每一轮观测后，我们设定有一个一分钟的间隔，那就是每一轮隔一分钟嘛，现在还有什么必要来讨论各轮之间的间隔呢？问题是这个每一轮隔一分钟是建立在本轮为无效轮的情况下的。如果是有效轮的话，那么间隔将不是一分钟。前面介绍了无效组的组序，就无效组 AB 在这一有效轮中的组序，比如 AA,AB,AA 这一组中 AB 的组序是 2，那么本有效轮观测后，需要间隔 1+无效组的组序 2，也就是 1+2 等于 3，也就是本轮观测后要等 3 分钟后再观测下一组。

为什么要设定这样一个间隔？这样是为了排除随机因素的影响。就像这一轮，发送方观测到的是 AA,AB,AA，那么接收方观察到的就是 BB,AB,BB。同样接收方可以看到 AB 出现在组序 2，也可以同样算出间隔是 1+2，发送方将休息 3 分钟再观测下一轮，自己这边也要等 3 分钟才观察下一轮。现在解决了各轮之间时间隔的问题，可以来模拟一轮次的通讯了。
在模式的设定下，我们设定要按以下顺序发送一节信息：1.双 AA,2.双 BB，3.双 AA，4.双 AA，5.双 BB,6.双 BB。这只是为了举例方便这样设定，并非不可更改。现在到了约定通讯时间，比如 3XXX 年一月一日零时正。00：00:00 双方都到了通讯室。通讯流程如下：
1.00：00:00 到 00：00:40 发送方观测本端的两个量子为 AB。00：00:41 到 00：00:60 接收方观察本端的两个量子为 AB。
2.00：01:00 到 00：01:40 发送方观测本端的两个量子为 AB。00：01:41 到 00：01:60 接收方观察本端的两个量子为 AB。
3.00：02:00 到 00：02:40 发送方观测本端的两个量子为 AA。00：02:41 到 00：02:60 接收方观察本端的两个量子为 BB。
到此完成了第一轮 3 组的观测，发送方结果 AB,AB,AA，接收方结果 AB,AB,BB。无论发送方还是接收方都明白这一轮未出现双 AA，所以为无效轮，双方各休息一分钟后重新开始。
1.00：05:00 到 00：05:40 发送方观测本端的两个量子为 BB。00：05:41 到 00：05:60 接收方观察本端的两个量子为 AA。
2.00：06:00 到 00：06:40 发送方观测本端的两个量子为 AB。00：06:41 到 00：06:60 接收方观察本端的两个量子为 AB。
3.00：07:00 到 00：07:40 发送方观测本端的两个量子为 BB。00：07:41 到 00：07:60 接收方观察本端的两个量子为 AA.
到此完成了第二轮 3 组的观测，发送方结果 BB,AB,BB，接收方结果 AA,AB,AA。无论发送方还是接收方都明白这一轮出现双 AA，所以为有效轮，本节信息的第 1 个双 AA 已经发送到了接收方。而且本轮的无效组 AB 在这一有效轮中的组序为 2，所以 1+2 等于 3，双方都明白要各休息三分钟后重新开始。按照前面约定的顺序：1.双 AA,2.双 BB，3.双 AA，4.双 AA，5.双 BB,6.双 BB。下一轮发送方要发送的是双 BB。
1.00：12:00 到 00：12:40 发送方观测本端的两个量子为 AB。00：12:41 到 00：12:60 接收方观察本端的两个量子为 AB。
2.00：13:00 到 00：13:40 发送方观测本端的两个量子为 AA。00：13:41 到 00：13:60 接收方观察本端的两个量子为 BB。
3.00：14:00 到 00：14:40 发送方观测本端的两个量子为 AA。00：14:41 到 00：14:60 接收方观察本端的两个量子为 BB.
到此完成了第三轮 3 组的观测，发送方结果 AB,AA,AA，接收方结果 AB,BB,BB。无论发送方还是接收方都明白这一轮出现双 BB，所以为有效轮，本节信息的第 2 个双 BB 已经发送到了接收方。而且本轮的无效组 AB 在这一有效轮中的组序为 1，所以 1+1 等于 2，双方都明白要各休息两分钟后重新开始。按照前面约定的顺序：1.双 AA,2.双 BB，3.双 AA，4.双 AA，5.双 BB,6.双 BB。下一轮发送方要发送的是双 AA。
好了，到此为止已经进行了 3 轮，传送了 1.双 AA,2.双 BB。基本上模式的流程已经出来了，下面的 3.双 AA，4.双 AA，5.双 BB,6.双 BB。就以此类推，不一一列举出来了。那么怎么决定一段信息是否结束呢？最简单的方法就是完成双方事先确认的模式。比如前面 1.双 AA,2.双 BB，3.双 AA，4.双 AA，5.双 BB,6.双 BB。就算一段，但这样会带来后面编码的困难。因此我们必须有下面这个事先的约定：也就是我们在一定的时间内必须且只能传一段信息。比如前面就设定了 2 个小时为一个信息节。2 个小时 120 分钟，就必需配备 180 对量子以备一节信息。现在我们按上面的模式在 2 小时内传了一段有效信息即：1.双 AA,2.双 BB，3.双 AA，4.双 AA，

5.双 BB,6.双 BB。那么这一段信息代表什节呢，接收方收到这个信息明白，这个不是偶然的，是经过人工择定后发送的信息。按照二进制编码，这一小时里的这一段信息只能编为一个 1 或者一个 0.暂且编为 1 吧。是的，就是这么低效，一小时只能发一个 1 或一个 0，但是考虑到这可能是几百几千光年之间的信息传输，这个效率也是可以接受的。现在我们编码了 2 进制中的一个 1，那么 0 怎么办呢？好办，在下 2 个小时内，我们在开始的 40 秒里,也就是 3XXX 年一月一日 02：00:00 到 02：00:40 就将本节所有的量子 180 个全观测完毕，这样的结果就是接收方的人观察到，这一个小时的量子是无规则的，它不可能出现像上面的 1.双 AA,2.双 BB，3.双 AA，4.双 AA，5.双 BB,6.双 BB。并且恰好符合每一轮的无效组的组序所决定的各轮间隔时间。那这一小时它传输的就是 0。然后依次类推就可以按 2 进制编码来进行信息传送了，而这个可是超距的信息传送。

结论:这里例举的通讯模式未必是最优，是可以做各种改变与优化的，重要的是对量子分组并间隔发送的思路才是决定性的。当然也不能排除未来还有其他更有效的方式。