Bh

Superluminal communication (FTL) is considered by many impossible for many reasons. In this short brief we shall offer a suggestion of an experiment that shall enable superluminal communication, with use of the collapse of the wave function.

The principle that shall be used is the "which way" measurement, that causes wave functions to collapse. If we measure "which way information", no interferometry pattern appears on a screen if particles pass through a double slit and interfere on that screen.

If the information wasn't measured, however, an interferometry pattern will appear on the screen.

Now, to obtain superluminal communication, we must first set an interferometer and shine light through it, but we must send the "which way information" to a far distance from that light.

If the "which way" information will be measured from afar, no interferometry pattern will appear on the screen. If however the information was erased by some kind of quantum eraser, an interferometry pattern will appear on the screen.

A good way to create which way information is to use entangled photons, entangled by an SPDC. The problem with this method is that the noise disables us from creating communication. Rather we need to use a coincidence counter which finds entangled photons out of non-entangled photons. The coincidence counter is connected to all detectors and by so preventing superluminal communication.

However, if we want to separate signal from idler, place which way information on the idler and either measure or erase it as it affects the signal, we need to find the signal between all non-entangled photons. With the SNR of entangled photons/non entangled photons this seems impossible.

However, if the ratio: Entangled photons\non entangled photons reaches for example 1:10, we can send idler photons to one side (10 light years away) of the experiment, and signal photons to the other side (10 light years away). Now, we can pass the photons through a beam splitter and through a polarization barrier that sends for instance horizontally polarized photons to the right side and vertically polarized photons to the left side. Now, measuring the far idler will cause the signal's wave function to collapse. If we can measure a sample of the interferometry pattern shown on the screen, we will receive an interferometry pattern that is a bit ruined. Statistically, the incompatibility between this pattern and the an standard interferometry pattern will be (standard interferometry pattern\no interferometry pattern)* Entangled photons\non entangled photons (Cos (Ax)Sinc(Ax)/Gaussian)* Entangled photons\non entangled photons. This incompatibility can be found for example where the ratio between entangled photons\non entangled photons is 1:10, and interferometry pattern/no interferometry pattern is 1:2.

In this case, after 10,000 photons passed, then if the information on the idler was erased then the compatibility between the interferometry pattern on the screen is 1:1. However, if it wasn't erased, then if for example we are looking at a position which statistically 1% of all photons will arrive at in an interferometry pattern, then instead of 100 photons per 10,000 photons, we will receive 90 photons from the non-entangled photons (1% of 9000) and 20 photons from the entangled photons, which sums up to 110, almost a 10 percent difference.

However, the noise yet be too strong.

In order to overcome this problem we need to use a multiple entanglement system, with three or more entanglements.

Here, we can entangle 3 or more photons, send 50% of the photons to a system including a system that separates orthogonally polarized photons, a beam splitter and a coincidence counter afterwards, and the other 50% to a very distant location measuring polarization. The polarization measurement of the 50% will include the measurement of the idler, which will cause the signal interferometry pattern to collapse.

However, with the coincidence counter we can detect which photons were entangled, and measure interferometry pattern only on these photons.

According to HS Eisenberg the SNR Double entanglement/Triple entanglement is about 1:2, which means that the noise reduction now enables quantum communication.

For example, if we decide to measure which way information in the idler, then on the signal's side, for every 2 pairs of entangled photons that will form an interferometry pattern, 1 pair will not form an interferometry pattern.

This can be detected by measuring location in the interferometry patterns, that the percentage of finding photons in them is very low. The percentage of finding photons in these places if the interferometry pattern collapsed however is significantly higher. If this ratio (Interferometry pattern/Collapsed wave function) stands on X, then after the collapse of the wave function it is possible to detect this collapse.

Again, we can use the same measurement stated earlier.