

FTL by Down-converting (Revised)

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FTL by Down-converting (Revised)

A method is proposed here to achieve faster than light (FTL) communication by the use of down-converters. A down-converter splits a photon into two photons each having half the energy of the original photon.

Suppose we have a sender Alice, a receiver Bob, and an intermediary facilitator Charlie. Charlie uses a beam splitter to create two beams of laser light: L the left beam and R, the right beam. Charlie then down-converts the L beam to create beams L1 and L2, and similarly creates beams R1 and R2 from the beam R. Beams R2 and L2 are normal path or "signal" photons through the down-converter, while beams R1 and L1 are called "idler" photons. "Beam" here means a flow of individually detectable photons sent in very short intervals so as to provide a useful rate of communication. Charlie directs beams L1 and R1 to Alice and beams R2 and L2 to Bob. The corresponding photons arrive at both Bob and Alice at nearly the same time, but here assume Alice receives hers first, but just barely before Bob.

Bob directs beams R2 and L2 such that they can create an interference pattern in a set of detectors arranged so it is feasible to rapidly and with high probability determine whether an interference pattern is present or not. The signal photon beams R2 and L2 can create such an interference pattern because they are the two paths from a beam splitter.

Alice can direct her idler beams L1 and R1 at will, in a co-linear fashion, to opposing sides of a half silvered mirror, but at an angle of 45 degrees. Fig.1, which requires fixed font (e.g courier) to view, shows this configuration. Half of L1 and half of R1 then goes to a detector DL. Similarly, half of L1 and half of R1 then goes to a detector DR. The beams emerging from both sides of the mirror are thus fully mixed, and the which-path information for all photons is lost. In this case Bob must see an interference pattern. If Alice then diverts her beams directly to detectors, the which-way information is then restored to 100 percent available, and Bob must see a bimodal distribution.

Full Mirror

