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Entanglement distribution of photon pairs coexisting with White Rabbit synchronization signals on the same optical fiber

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Challenges in building large scale quantum networks are high precision time synchronization, and fluctuating conditions of the fiber links, which impact the quality of entanglement between transmitted photon pairs. White Rabbit (WR) can be used to synchronize two distant quantum network nodes with high precision. Multiplexing the optical WR signals on the same fiber as the quantum signal allows for monitoring and compensating the changes in this fiber, as both signals experience the same conditions. Here, the WR –quantum coexistence experiment which will be performed at CERN is presented, along with the results of power fluctuation tests on the WR signals.

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