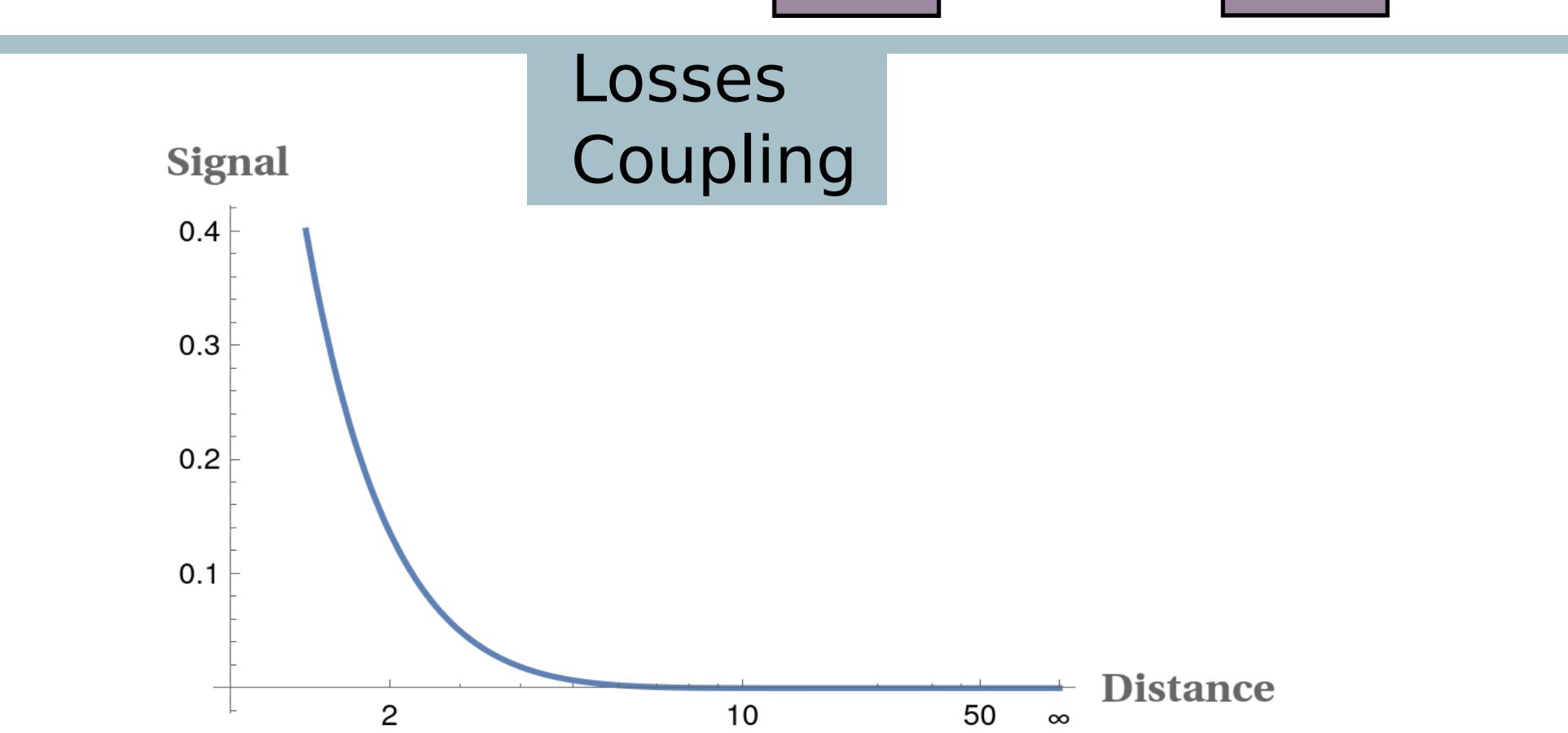
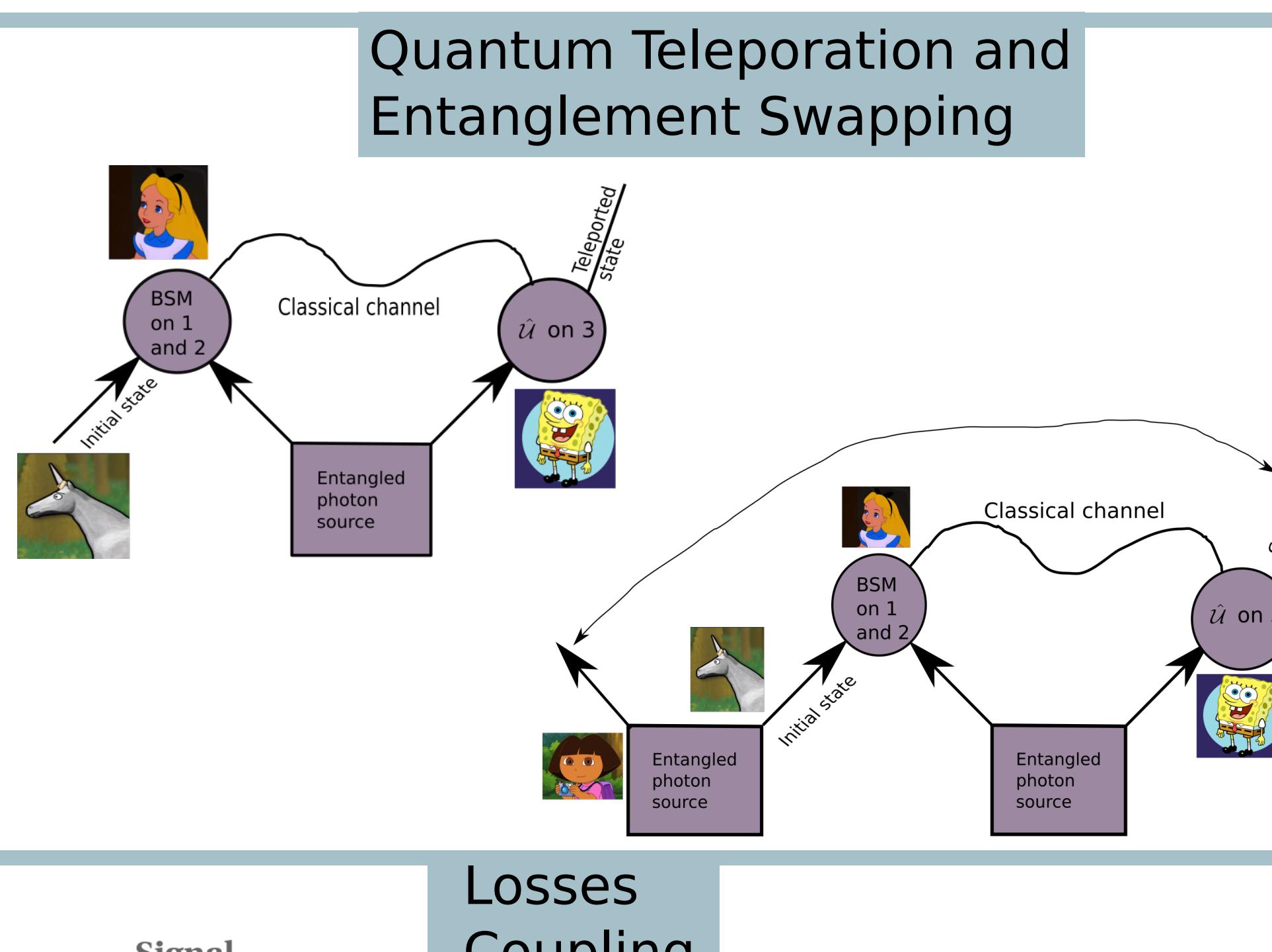


Using a Sagnac interferometer in a minimal configuration with a 50 mm Type-0 PPLN crystal. By pumping the crystal bidirectionally we generate one of four maximally entangled states:
 $\phi^\pm = |HH\rangle \pm |VV\rangle$
After characterization we will demonstrate Quantum Teleportation and Entanglement Swapping between two distant parties, and possibly for QKD applications.

Generating and Teleporting Entanglement for Quantum Networks and the Quantum Internet



Entanglement is a key resource for quantum technologies of the future, and the development of the quantum internet. Having the ability to efficiently distribute it between distant parties is essential. We implement a Sagnac source of polarization entangled photons around 1560 nm for use in already existing fiber infrastructure. The source will be characterized in our lab at the Faculty of Mathematics and Physics in Ljubljana, and later will be used for entanglement distribution over large distances. An identical source will be built by partners at the Jozef Stefan Institute, allowing us to demonstrate teleportation and entanglement swapping by performing Bell state measurements.



Entanglement Swapping is a way to mitigate fiber losses, get better signal integrity (reduced noise due to fiber imperfections), and lower cost, as ultra-low loss fibers must be specially made for certain wavelengths.

