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DEMONSTRATION OF AN ENTANGLED PHOTON SOURCE ON A CUBESAT FOR FUTURE SPACE-BASED QUANTUM NETWORKS

Abstract

SpooQy-1 is a 3U spacecraft that hosts a quantum light source capable of generating and detecting polarization-entangled photon pairs. SpooQy-1 was launched into a Low Earth Orbit from the International Space Station on the 17th of June 2019 and has since been operated successfully from RF ground stations in Singapore and Switzerland. This mission is only the second demonstration of quantum entanglement measurement in Space and the first time this has been done on a CubeSat. QKD QubeSat, a follow-on mission by the Centre for Quantum Technologies, will demonstrate space-to-ground entanglement distribution using a 12U satellite platform and optical terminal provided by RAL Space in the UK. The capabilities of SpooQy-1 and QKD QubeSat provide a clear path towards space-based quantum network nodes that distribute entanglement as a resource globally for quantum communication purposes, e.g. key distribution, teleportation of information and networking of future quantum computers and quantum devices.