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NanoQEY Quantum Key Distribution Satellite

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NanoQEY (Nano Quantum EncrYption satellite) is a demonstration satellite which will show the feasibility of implementing Quantum Key Distribution (QKD) between two ground stations on earth using a satellite trusted node approach. One of the main objectives of NanoQEY is to eliminate the necessity for a fine pointing system which will reduce cost and planning time for a satellite. The system will also be simplified from many models that have been proposed due to the smaller space and mass allowances. A few of the QKD satellites that have been proposed are also formatted in the downlink scenario, whereas NanoQEY will be implemented in an uplink scenario. Since the satellite is only used for photon collection and data processing, it is not necessary to have many of the complicated systems on board which would be required for a downlink. The main purpose of NanoQEY is to construct a payload which will be operational for a QKD demonstration and fit onto a nano-satellite in terms of mass and power budgets. However, because of the fine pointing simplification of the satellite, the ground stations will need to compensate for the lack of targeting on the satellite. These ground stations will have to have very fine pointing and tracking capabilities. We have undergone a study to determine the feasibility of a nano-satellite project to implement QKD for world-wide QKD demonstrations and the requirements on a ground station to achieve these goals.

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