Paper ID: 3681
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SPACE SYSTEMS SYMPOSIUM (D1)
Enabling Technologies for Space Systems (2)

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QUANTUM RADAR FOR SPACE APPLICATION

Abstract

The Einstein-Podolsky-Rosen paradox in quantum mechanics reveals that if two particles interact, they become correlated in such a manner that by measuring the position of one particle the wave function of the other will be in a definite position state, regardless of the spatial separation. Using the entanglement principle of Quantum Mechanics it is possible to communicate information instantaneously. However, it cannot be exploited for superluminal communications (i.e. beyond the speed of light), as it would violate causality as defined in special relativity. Nevertheless, quantum communications guarantees the distribution of random sequences of bits with a level of confidentiality that cannot be achieved by any classical means. A RADAR is said to be a quantum radar if at the detector level we have insufficient RF target photon density to invoke classical physics by means of the Gaussian central limit theorem and quantum entanglement. This paper will present a Space quantum RADAR using methods of quantum cryptography and teleportation. It is the first time that a complete proposal of a quantum entanglement instrument is taking place. The advantages of such an instrument would be great for Sustainable Peace and scientific progress in space.