

Emulating Gravitationally-Induced Frequency Shift Towards Space-Based Quantum Optics

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Space-based quantum networks require highly efficient quantum links between ground systems on Earth and orbiting spacecraft. A test system at JPL emulated timing desynchronization and polarization rotation driven by the relative motion between Earth and a spacecraft. These dynamics are introduced to a single-photon communication system and addressed using compensation systems. The system under development at JPL is planned to be deployed at the Optical Communication Telescope Laboratory in Wrightwood, CA, and coupled to the 1-m aperture primary mirror in support of near-term quantum communications space missions.

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