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4.6 Satellite Quantum Communications exploiting SLR at MLRO

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Quantum Communications (QC) in Space are gaining a strong momentum for both providing the way to realize tests on the interplay of Quantum Physics and Gravity on very long scale and for terminals in relative motion as well as to provide a network of secure communications on planetary scale.

In our study we addressed the extension of the single photons exchange, initially demonstrated for LEO orbits to a source in MEO orbit and we extended the physical degree of freedom used for the encoding of the qubit from the polarization initially used, to the temporal modes. In both cases, QC are referenced to the SLR pulses used at MLRO - Matera Laser Ranging Observatory of the ASI Italian Space Agency, in Matera, Italy.