# Towards quantum communication from global navigation satellite system

Luca Calderaro,[1] Costatino Agnesi,[1] Daniele Dequal,[2] Francesco Vedovato,[1] Matteo Schiavon,[1] Alberto Santamato,[1] Vincenza Luceri,[3] Giuseppe Bianco,[2] Giuseppe Vallone,[1] and Paolo Villoresi[1]

[1] *Dipartimento di Ingegneria dell'Informazione, Università di Padova, via Gradenigo 6B, 35131 Padova, Italy.*
[2] *Matera Laser Ranging Observatory, Agenzia Spaziale Italiana, Matera, Italy*
[3] *e-GEOS SpA, Matera, Italy*

Satellite-based quantum communication (QC) is an invaluable resource for the realization of a quantum network at the global scale. In this regard, the use of satellites well beyond the low Earth orbit gives the advantage of long communication time with a ground station. However, high-orbit satellites pose a great technological challenge due to the high diffraction losses of the optical channel, and the experimental investigation of such quantum channels is still lacking. Here, we report on the first experimental exchange of single photons from a global navigation satellite system (GNSS) at a slant distance of 20 000 km, by exploiting the retroreflector array mounted on GLONASS satellites. We also observed the predicted temporal spread of the reflected pulses due to the geometrical shape of the array. Finally, we estimated the requirements needed for an active source on a GNSS satellite, aiming towards QC from GNSS with state-of-the-art technology. [1].

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