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Fast imaging of single photons for astronomical applications

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Fast imaging of optical photons may play important role not only in particle physics experiments but also in astronomical observations. It has been recently suggested that optical interferometers would not require a phase-stable optical link between the stations if instead sources of quantum-mechanically entangled pairs could be provided to them, enabling extra-long baselines and, therefore, much improved astrometrical precision. To efficiently interfere the photons must be close enough in time and frequency or, formulating it differently, to be indistinguishable within the Heisenberg uncertainty principle. This sets stringent requirements on temporal measurements needed to determinate the two-photon correlators. Here we discuss requirements on the instrument for those observations, in particular, on its temporal and spectral resolution. We will also discuss possible technologies for the instrument implementation and first proof-of-principle experiments.

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No, this is an entirely new submission.

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