Prof. Christian Kurtsiefer
Centre for Quantum Technologies / Physics Dept.
3 Science Drive 2
National University of Singapore
Singapore 117543

Tel. +65-6516-1250

email:
phyck@nus.edu.sg

5 Nov 2026

Dear Editor,

We like to submit an original research article on “Clock Synchronization with Weakly Correlated Photons” for consideration by Optics express. This manuscript has not been published elsewhere and is not under consideration by another journal, but has been uploaded to the arXiv preprint server. All authors have approved the manuscript and agree with its submission to Optics Express. There are no materials reproduced from other sources, and we declare no conflicts of interest.

in our manuscript, we present an application to use photon-bunched light, like thermal or pseudo-thermal light with its relatively weak temporal correlations to synchronize two remote clocks.

The presented method uses a simple method to prepare photon-bunched light from laser light through self-interference of mutually incoherent parts of the laser light, and numerical algorithms to extract the exact temporal position of the photon bunching observed by two remote receivers looking to different clocks with an uncertainty of the exact time and frequency difference between these clocks. This information can be used to synchronize these clocks, perhaps present in a quantum communication scenario where an optical link is present already. The loss of the optical connection can be quite substantial (we show >2x100dB), and survives with relatively weak correlation signatures as well.

We therefore believe this manuscript may be interesting to the audience of Optics Express as it showcases an actual application of thermal or photon-bunched light.

On behalf of all authors, we thank you for your consideration of our manuscript.

With Best Regards,

Christian Kurtsiefer