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Dear Editor,

We like to submit an original research article on “LIDAR with Optically Amplified Thermal Light” for consideration by Optica. 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 Optica. There are no materials reproduced from other sources, and we declare no conflicts of interest.

In this work, we present a strong source of thermal light with a long enough correlation time of the photon bunching feature to be detected by standard single photon detectors by using a chain of optical amplifiers of a primary source of thermal light. We use this thermal light source with its temporal correlations in a LIDAR demonstration with a realistic non-cooperative target over a distance of 1.3km (with a return loss around 110dB). This complements recent LIDAR demonstrations with quantum light sources based on parametric conversion in addressing the huge return loss in realistic scenarios, with a potential to increase the power of thermal light even further.

While the quantum nature of thermal light may be debatable, this demonstration relies correlation measurements and the physical origin of the randomness of light field fluctuations in the same way as recent quantum light LIDAR experiments do. As such, we feel that this concept is of interest to a wide spectrum of researchers involved in optical quantum technologies. so we believe it meets the interest of the wider audience of Optica.

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

With Best Regards,

Christian Kurtsiefer