Dear Editor,

We would like to submit the enclosed manuscript entitled "Modulating quantum ﬂuctuations of scattered lights in disordered media via wavefront shaping", for publication in Journal of the Optical Society of America B. I would like to declare on behalf of my co-authors that the work described is an original research that has not been published previously, and is not under consideration for publication elsewhere, in whole or in part. We have solicited suggestions from all the authors, have reviewed the final version of the manuscript and have approved it for publication.

In this work, we focus on quantum fluctuation of the scattered lights as described below:

When lights propagate through a disordered medium, wavefront shaping was initially proposed to manipulate the scattered lights in a desired pattern. Now wavefront shaping is applied to modulate quantum fluctuations of the scattered beams. Here we theoretically study the quantum noise of quadratures of the scattered modes in the presence of wavefront shaping with squeezed-state sources (single- and two-mode squeezed states). It is found that wavefront shaping can suppress the quantum noise for both squeezed-state inputs. Importantly, our work shows that when the single-mode squeezed states are considered as inputs, the quantum fluctuation can always be reduced, even below the shot-noise level. In addition, we discuss that with the increase of the disorder degree of the disordered medium, the quantum noise with wavefront shaping would increase. On top of that, an intuitive explanation is given for this quantum-noise reduction. These results may have potential applications in quantum information processing, for instance, sub-wavelength imaging using the scattering superlens with squeezed-state sources. We hope this paper is suitable for Journal of the Optical Society of America B.

The following is a list of possible reviewers for your consideration:

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We deeply appreciate your consideration of our manuscript, and we look forward to receiving comments from the reviewers. If you have any queries, please don’t hesitate to contact me at the address below.

Sincerely yours,

Dong Li

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