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Title: **Harnessing mechanical deformation to reduce spherical aberration in soft lenses**

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Dear Editor,

We are excited to submit our work, "Harnessing mechanical deformation to reduce spherical aberration in soft lenses" for consideration as an article in the *Physical Review Letters*. In this study, we demonstrate that that by pulling an elastomeric bi-convex lens we not only alter its focal length, but can also largely reduce its spherical aberration.

Inspired by the crystalline lens and ciliary muscle of the human eye, intense efforts have been devoted to the design of optical lenses with adjustable properties. While most studies have focused on the tunability of the focal length, here we use a combination of experiments, numerical simulation and analysis to show that an applied tensile strain can also largely reduce spherical aberration. We first demonstrate the concept for a cylindrical elastomeric lens and then show that it is robust and valid over a range of geometries and material properties. As such, our study suggests that large mechanical deformations may provide a simple route to achieve the complex profiles required to minimize aberration and realize lenses capable of producing images of superior quality.

For reviewers, we suggest the following experts:

Douglas P. Holmes, Boston University, Boston, USA, `dpholmes@bu.edu`

José Bico, Sorbonne Université, Paris, France, `jose.bico@espci.fr`

Federico Carpi, University of Florence, Italy, `f.carpi@centropiaggio.unipi.it`

This material has not been published and is not under consideration for publication elsewhere.

We thank you for your consideration and look forward to hearing from you.

Sincerely,

Katia Bertoldi

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