Contribution ID: **93** Type: **Poster**

【722】Direct holographic measurement of torque and individual forces with optical tweezers

Tuesday, 31 August 2021 19:02 (1 minute)

Optical tweezers are a powerful tool for measuring tiny forces on the microscale. However, when multiple traps are used, it is challenging to simultaneously measure the individual forces and torques.

We present a generally applicable holographic force measurement method to recover the individual forces based on a single farfield image. As this method does not require information about size, shape, or optical properties of the particle it is well suited to study biological specimen. We demonstrate measurements for up to ten traps, and disentangle the individual forces on a red blood cell stretched by four optical traps.

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Session Classification: Poster Session

Track Classification: Biophysics, Medical Physics and Soft Matter