Abstract Submitted
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**Optimization of holographic optical tweezers for multiplexed fluorescence spectroscopy**[1] MATTHEW CIBULA, DAVID MCINTYRE, Oregon State University — We are developing a multiplexed spectroscopy technique that employs holographic optical tweezers to trap and excite multiple sensor particles. Our goal is to develop a lab-on-a-chip measurement platform for monitoring pH and other ion concentrations with high spatial resolution in a microfluidic device or within biological cells. To ensure efficient use of the available laser power required to trap multiple particles, we address three aspects of the spatial light modulator (SLM) used in the holographic technique. We measure and optimize the input and output polarizations used before and after the birefringent SLM. We reduce optical aberrations by adding appropriate Zernike polynomials to the computed hologram. We optimize the diffraction efficiency of the SLM by adjusting the gray scale input-to-output table to account for the nonlinear phase response of the SLM.

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