Robust Digital Holography For Ultracold Atom Trapping
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We have formulated and experimentally demonstrated an improved algorithm for design of arbitrary two-dimensional holographic traps for ultracold atoms. Our method builds on the best previously available algorithm, MRAF, and improves on it in two ways. First, it allows for creation of holographic atom traps with a well defined background potential. Second, we experimentally show that for creating trapping potentials free of fringing artifacts it is important to go beyond the Fourier approximation in modelling light propagation. To this end, we incorporate full Helmholtz propagation into our calculations.

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