



DEVICES AND METHODS TO TRAP ARRAYS OF ISOLATED PARTICLES OF MULTIPLE SPECIES

[View U.S. Patent Application Publication No. US-2025-0210215 in PDF format.](#)

WARF: P240121US01

Inventors: Mikhail Kats, Chengyu Fang, Mark Saffman, Sanket Sushil Deshpande, Preston Huft

The Invention

UW-Madison researchers have created new innovations to improve neutral atom-based quantum processing. First, new optical intensity masks for trapping two-dimensional arrays of neutral atoms of two species, using a single laser, have been created. Unique geometrical dimensions and material requirements for generating optical patterns that can be used for trapping arrays of one or two neutral atomic species were created. In particular, the transmission mask now accounts for the interference-based ripples in the intensity in the image plane. To achieve the desired transmittance and small phase shift in background region, a thin layer of material (such as germanium) is used. This provides an intermediate degree of absorption such that a subwavelength-thick layer of this material can result in absorption of 20-30% of the incident light without a significant phase shift, and the absorption is not so high such that the transmittance can be controlled on the single-% level by changing deposition conditions such as deposition time. This uses semiconductor-industry-compatible processes to fabricate the designed intensity mask.

Additional Information

For More Information About the Inventors

- [Mikhail Kats](#)
- [Mark Saffman](#)

Tech Fields

- [Information Technology : Hardware](#)

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842