Docket #: S26-175

Fourier Plane Cavity Arrays

Stanford researchers have developed an optical platform that crosses many high-finesse cavities at a single point to greatly strengthen how atoms interact with light.

High-fidelity quantum networking and fast atom readout require cooperativities above 10,000, yet today's single-cavity systems reach roughly 10 to 100. Pushing a single cavity further brings prohibitive aberrations and alignment sensitivity, or intolerable loss.

The Stanford platform overlaps many independent cavities in a common region, multiplying cooperativity without requiring lossy intracavity optics. Each atom couples independently, and atom-by-atom signals can be recovered from the combined cavity output.

Stage of Development:
Proof of concept

Applications

- Fast, low-heating qubit readout for neutral-atom quantum computers
- Atom-light interfaces for high-fidelity quantum networking

Advantages

- Cooperativity grows with cavity count
- Requires no intracavity optics, avoiding their associated loss and aberrations

Innovators

- Jon Simon

- David Schuster

Licensing Contact

David Mallin

Licensing Manager, Physical Sciences

Email