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Deterministic Creation of Single Photon Emitting Interface Emitters

A lithographic process that reliably produces millions of room-temperature single-photon sources per wafer for scalable quantum photonics.

Researchers at Purdue University have developed a method for the deterministic creation of single photon emitters. This method offers a solution to one of the primary limitations in this field, as it is highly scalable and capable of producing millions to billions of single photon emitters on a standard wafer with subwavelength accuracy. The researchers grew SiN on SiO2 films using High Density Plasma Enhanced Chemical Vapor Deposition (HDPCVD), performed lithography defined nanopatterning, and post annealing using Rapid Thermal Annealing (RTA) to create lithographically defined single photon emitters. Potential applications of this technology include quantum information technology, communications, sensing, and security.

Advantages:

- Scalable for industrial needs (millions to billions of emitters on a standard wafer)

- High resolution (+/- 85 nm)

Applications:

- Quantum Information Technology

- Quantum Sensing

- Quantum Communication

- Quantum Integrated Circuits

- Quantum Security

TRL: 3

Intellectual Property:

Technology ID
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Category
Computing/Quantum Technologies
Semiconductors/Packaging & Integration
Materials Science & Nanotechnology/Nanomaterials & Nanostructures

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