PROJECT NUMBER

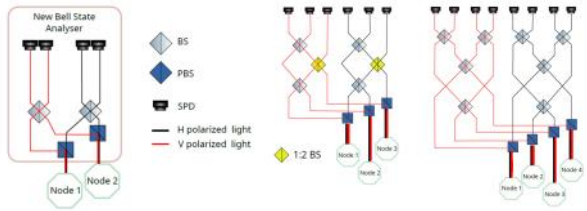
22914

New Bell state analyser for photonic integrated circuits

Entanglement-sharing technology enables scalable quantum networks via integrated photonics.

Sharing entanglement across networks is a key requirement for long range quantum computing and networks. Current Bell state analysers require optical polarisations to be conserved, which is challenging for photonic integrated circuits. The Oxford invention is easily implemented in photonic integrated circuits.

Applications: Quantum networks, quantum computing, communication networks



Features	Benefits
Bell state analyser swaps quantum entanglement of photons	Enables long range quantum communication and networks
Unlike previous Bell state analysers, different optical polarisations travel through different paths	Analyser can be produced as photonic integrated circuit, avoiding bulky optics
Well-proven photonic integrated circuit technology	Volume manufacture of high-performance, stable and compact units
Scalable to entangle multiple nodes. Examples of 3 and 4 node systems shown above	Enables complex quantum networks and distributed quantum computers

Features	Benefits
Systems can entangle fewer nodes (e.g. 4 node system entangles 3 nodes) without needing physical reconfiguration	

Patented and Available for

- Co-development
- Consulting
- Licensing

To find out more, contact enquiries@innovation.ox.ac.uk and quote the project number.

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