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High-dimensional optical encodings for integrated error-protected Quantum Computing and Quantum Communication

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The control of large photonic integrated devices, processing tailored entangled resources of error-protected qubits, is an important step towards realising an all-photonic quantum computer. Measurement-based encodings, computing tasks and applications, showing improvements in such devices' computational performance, will be shown. Furthermore, future perspectives on the advantages of the distribution of the above resource entangled states over chip-based quantum networks will also be discussed.

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