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“Neuromorphic encoding of quantum entanglement“

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ABSTRACT

Neuromorphic hardware systems are designed to emulate certain structural and dynamical properties of biological neuronal networks, with the aim of inheriting the brain's functional performance and energetic efficiency in artificial intelligence applications. An entirely different application space for these devices is the simulation of quantum many-body physics. We developed a scheme for encoding entangled quantum states on a neuromorphic chip. As a first demonstration we encoded maximally entangled states of few qubits allowing the observation of Bell correlations, thus showcasing that generic features of quantum systems can be captured by spiking neural dynamics.

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