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$O(3)$ model in 1+1-dimensions using qumodes

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We express non-linear sigma $O(3)$ model in a form suited to continuous variable (CV) approach to quantum computing by rewriting the model in terms of boson operators in an infinite-dimensional Hilbert space. We show that it is possible to reach the scaling regime with truncation of the Fock space by considering $\mathcal{O}(10)$ photons at each site. This is an indication that it might be possible to reach the scaling regime with resources within the reach of photonics quantum hardware by the end of this decade.

Topical area

Quantum Computing and Quantum Information

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