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Robust engineering of universal Gaussian cluster states for continuous variable measurement-based quantum computation

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We first show that any Gaussian cluster state of N bosonic modes can be generated by a multi-mode squeezing transformation. and provide the explicit recipe. We then use this result to show that a large class of pure entangled CV Gaussian states, including 2D-cluster states, can be robustly generated as a unique steady state of a dissipative dynamics employing minimal resources. In fact, this is achievable using only a single-site squeezed driving and passive bilinear interactions. We provide the explicit protocol which corresponds to the engineering of a suitable excitation number conserving Hamiltonian.This fact can be used for the implementation of universal continuous variable measurement-based-quantum computation on various platforms.

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