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Abstract:	In this article, we present a dynamical scheme to obtain a reconfigurable noise-aided logic gate that yields all six fundamental two-input logic operations, including the xor operation. The setup consists of two coupled bistable subsystems that are each driven by one subthreshold logic input signal, in the presence of a noise floor. The synchronization state of their outputs robustly maps to two-input logic operations of the driving signals, in an optimal window of noise and coupling strengths. Thus the interplay of noise, nonlinearity, and coupling leads to the emergence of logic operations embedded within the collective state of the coupled system. This idea is manifested using both numerical simulations and proof-of-principle circuit experiments. The regions in parameter space that yield reliable logic operations were characterized through a stringent measure of reliability, using both numerical and experimental data.
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