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Do emergent entangled coherent Glauber states violate the no-signaling theorems of quantum theory? JACK SARFATTI, ISEP — Quantum information theory assumes entanglement cannot be used as a direct stand-alone-communication channel without a light speed limited retarded signal key to unlock the message encrypted in the correlation pattern. This pre-supposes orthogonal base states for the entangled subsystems. Macro-quantum coherent Glauber states emerge as ground/vacuum states in spontaneous broken symmetries that describe the Higgs-Goldstone fields of many real/virtual particles. They are distinguishably non-orthogonal and over-complete. In the bipartite case, Alice's two distinguishable non-orthogonal sender Glauber coherent base states are entangled with Bob's two orthogonal receiver Q-BIT base states. The Born rule for strong von-Neumann projection measurements using the orthodox constant $\sqrt{2}^{-1}$ normalization gives an entanglement signal

$$S_{Bob}\,(0/1) = \underset{Alice}{\mathrm{Tr}}\,\{|\rangle_{Bob\,Bob}\,\langle(0)1|\,|\rangle\,\langle Bob, Alice|\}$$
$$= \tfrac{1}{2}\left(1 + \left|{}_{Alice}\left\langle \sqrt{\langle n\rangle}e^{\theta}\;\middle|\;\sqrt{\langle n'\rangle}e^{\theta'}\right\rangle_{Alice}\right|^2\right)$$

Emergent spontaneous symmetry breakdown violates the probability interpretation of orthodox quantum theory. It represents an extension of quantum theory in the same way that gravity required an extension of special relativity limiting it to coincident local inertial frames.

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