

Abstract Submitted
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Remote Semi-State Preparation as SuperDense Quantum Teleportation¹ HERBERT J. BERNSTEIN, ISIS Institute & School NS, Hampshire College — Recent advances in experimental technique make SuperDense Teleportation (SDT) possible. The effect uses remote state preparation to send more state-specifying parameters per bit than ordinary quantum teleportation (QT) can transmit. SDT uses a maximal entanglement to teleport the relative phases of an n -dimensional equimodular state. This means that one can send only $n-1$ of the total $(2n-2)$ parameters – comprising the relative phases and amplitudes – of a general state. Nevertheless, for $n \geq 3$, SDT sends more of these state-specifying parameters than QT for a given number of classical bits. In the limit of large n the ratio is 2 to 1, hence the nomenclature Bennett suggested, SDT, by analogy with SuperDense Coding. Alice’s measurements and Bob’s transformations are simpler than in QT. The roles of Charles the state chooser, and Diana who deploys it, are different than in QT. I briefly review possible experimental realizations, including two that are under consideration at the present time by an experimental group leading in higher-dimension entanglement work.

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