

# Can a “Hidden Variable” Quantum Theory Evade the “No-Cloning” Theorem?

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If YES, then we can look forward to physical realization of superluminal communication, as the original considerations of the “no-cloning” theorem [1]-[4] were motivated in part as an explanation of why certain schemes for superluminal signaling cannot work.

If NO, then it would seem that some aspects of the “hidden” variables must be “intrinsically hidden”, *i.e.*, “unknowable”, such that “hidden-variable” theories belong more to the “idealist” than to the “realist” school of thought.

*I pose this question without proposing a definite answer. I am unaware of any commentary on this topic during these 23 years since the formulation of the “no-cloning” theorem, but I would be pleased to be enlightened by more knowledgeable readers.*

## References

- [1] W.K. Wootters and W.H. Zurek, *A single quantum cannot be cloned*, Nature **299**, 802 (1982), [http://kirkmcd.princeton.edu/examples/QM/wootters\\_nature\\_299\\_802\\_82.pdf](http://kirkmcd.princeton.edu/examples/QM/wootters_nature_299_802_82.pdf)
- [2] D. Dieks, *Communication by EPR Devices*, Phys. Lett. A **92**, 271 (1982), [http://kirkmcd.princeton.edu/examples/QM/dieks\\_pl\\_a92\\_271\\_82.pdf](http://kirkmcd.princeton.edu/examples/QM/dieks_pl_a92_271_82.pdf)
- [3] P.W. Milonni and M.L. Hardies, *Photons Cannot Always Be Replicated*, Phys. Lett. A **92**, 321 (1982), [http://kirkmcd.princeton.edu/examples/QM/milonni\\_pl\\_a92\\_321\\_82.pdf](http://kirkmcd.princeton.edu/examples/QM/milonni_pl_a92_321_82.pdf)
- [4] The essence of the no-cloning theorem had been demonstrated earlier, but was little noticed; J.L. Park, *The Concept of Transition in Quantum Mechanics*, Found. Phys. **1**, 23 (1970), [http://kirkmcd.princeton.edu/examples/QM/park\\_fp\\_1\\_23\\_70.pdf](http://kirkmcd.princeton.edu/examples/QM/park_fp_1_23_70.pdf)