

Abstract Submitted
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Causality, Bell's theorem, and Ontic Definiteness JOE HENSON,
Perimeter Institute — Bell's theorem shows that the reasonable relativistic causal principle known as “local causality” is not compatible with the predictions of quantum mechanics. It is not possible maintain a satisfying causal principle of this type while dropping any of the better-known assumptions of Bell's theorem. However, another assumption of Bell's theorem is the use of classical logic. One part of this assumption is the principle of *ontic definiteness*, that is, that it must in principle be possible to assign definite truth values to all propositions treated in the theory. Once the logical setting is clarified somewhat, it can be seen that rejecting this principle does not in any way undermine the type of causal principle used by Bell. Without ontic definiteness, the deterministic causal condition known as Einstein Locality succeeds in banning superluminal influence (including signalling) whilst allowing correlations that violate Bell's inequalities. Objections to altering logic, and the consequences for operational and realistic viewpoints, are also addressed.

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