Näger, Paul M.

**The causal problem of entanglement.** (English) Zbl 1360.03060

*Synthese* 193, No. 4, 1127-1155 (2016).

Summary: This paper expounds that besides the well-known spatio-temporal problem there is a *causal* problem of entanglement: even when one neglects spatio-temporal constraints, the peculiar statistics of EPR/B experiment is inconsistent with usual principles of causal explanation as stated by the theory of causal Bayes nets. The conflict amounts to a dilemma that either there are uncaused correlations (violating the causal Markov condition) or there are caused independences (violating the causal faithfulness condition). I argue that the central ideas of causal explanations can be saved if one accepts the latter horn and explains the unfaithful independences by a stable fine-tuning of the causal parameters.

**MSC:**

03A10 Logic in the philosophy of science

03B48 Probability and inductive logic

62A01 Foundations and philosophical topics in statistics

**Keywords:**

quantum entanglement; Bell theorem; scientific explanation; causal Bayes nets; causal Markov condition; causal faithfulness condition

**Software:**

TETRAD

**Full Text:** DOI

**References:**


Zbl 0947.81013


Zbl 0746.68089


Zbl 0959.68116


Shimony, A; Kamefuchi, S (ed.), Controllable and uncontrollable non-locality, 225-230, (1984), Tokyo


doi:10.1007/BF0063886


doi:10.1007/978-94-009-7731-0


doi:10.1103/PhysRevLett.81.5039


This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.