The EPR Argument

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March 30, 2020

Background

1. Einstein had been dissatisfied with QM for about fifteen years.
   - 1.1 Failure of determinism (quantum jumps)
   - 1.2 Failure to explain in terms of local causes
2. Einstein had tried several times earlier to show that the uncertainy relations do not hold in principle.
3. Bohr had proposed the notion of *complementarity*.

The argument's structure

COM: The description of reality given by the wavefunction in quantum mechanics is complete.

DET: Q and P can have simultaneous reality.

Given from QM:	$\text{COM} \Longrightarrow \neg\text{DET}$
Argument by EPR:	$\text{COM} \Longrightarrow \text{DET}$

Completeness and the EE link

Eigenstate-Eigenvalue link: a quantity A has a value in state φ iff φ is an eigenstate for A.

The EE link is a way of cashing out "the description of reality given by the wavefunction."