Einstein vs. Bohr

1925
“Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?”
“Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?”
“Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?”
Professor Albert Einstein will attack science’s important theory of quantum mechanics, a theory of which he was a sort of grandfather. He concludes that while it is “correct” it is not “complete.” With two colleagues at the Institute for Advanced Study here, the noted scientist is about to report to the American Physical Society what is wrong with the theory of quantum mechanics. The quantum theory with which science predicts with some success inter-atomic happenings does not meet the requirements for a satisfactory physical theory, Professor Einstein will report in a joint paper with Dr. Boris Podolsky and Dr. N. Rosen.”

“Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?”
EPR II Einstein vs. Bohr 1951

Princeton Universita
a) spinová formulace

David Bohm (1917 – 1992)
\[ \psi(\vec{x},t) = \sqrt{\rho(\vec{x},t)} e^{\frac{i}{\hbar} S(\vec{x},t)} \]

\[ \frac{\partial \rho}{\partial t} + \vec{\nabla} \cdot \left( \rho \frac{\vec{\nabla} S}{m} \right) = 0 \]

\[ \frac{\partial S}{\partial t} + \frac{1}{2m} (\vec{\nabla} S)^2 + V - \frac{\hbar^2}{2m} \frac{\Delta \sqrt{\rho}}{\sqrt{\rho}} = 0 \]
EPR II

a) pilotní vlna
Wahrscheinlichkeitstheoretischer Aufbau der Quantenmechanik

J. von Neumann, Göttinger Nachrichten 1 (1927) 245–272

\[ \rho = \sum_i p_i \ket{\psi_i} \bra{\psi_i} \]
EPR II

b) matices hustoty
EPR II
věnečky