Evaluation of joint probabilities for non-commuting observables from correlations between quantum clones HOLGER HOFMANN, Hiroshima University — Universal quantum cloning processes must be able to copy all physical properties of a quantum system with equal fidelity. If the statistical interpretation of the quantum state is correct, quantum fluctuations of the input state are also copied, mapping the correlations between non-commuting observables onto the experimentally accessible correlations between separate systems. Here, I show that it is indeed possible to evaluate the correlations between the non-commuting properties of a quantum system from the correlations between measurements of two optimal quantum clones of the system. Significantly, the joint probabilities obtained from the analysis of cloning correlations are identical with the joint probabilities observed in weak measurements, indicating that such joint probabilities may provide the foundations for a consistent statistical interpretation of quantum physics.

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