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Quantum Control of Wave-Particle Duality

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Wave-particle duality, superposition and entanglement are among the most counterintuitive features of quantum theory. They clash with conventional classical wisdom and motivate the construction of hidden-variable theories. Here I point out that realism (defined as a property of photons being either particles or waves, but not both) is incompatible with determinism provided superluminal communication is forbidden. This places severe constraints on HV theories, which in turn can be subject to experimental tests using quantum delayed-choice experiments.

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