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Visualizing Quantum Erasure using a Series of Stern-Gerlach Magnets RICHARD BARNEY, JEAN-FRANCOIS VAN HUELE, Brigham Young University — In a standard Stern-Gerlach setup, a quantum object, or quanton, with nonzero spin has its position entangled with its spin by an inhomogeneous magnetic field. This entanglement causes the quanton to exhibit full particle behavior, allowing its spin to be measured by observing its position. We examine a modified setup which passes a beam of single quantons through multiple Stern-Gerlach magnets oriented at different angles perpendicular to the beam. This allows for full or partial erasure of each quanton's path information, recovering wave behavior expressed as self-interference. We present an analytic expression for the wavefunction of a quanton as it moves through such an apparatus. We also discuss a method of quantifying the quanton's wave and particle behaviors and show that these values follow a simple duality relation.

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