

Abstract Submitted
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Weak values of spin in atomic systems ROBERT FLACK, VINCENZO MONACHELLO, University College London, BASIL HILEY, Retired — Weak values have a long history and were first considered by Landau and London in connection with superfluids. Hirschfelder called them sub-observables and Dirac anticipated them when discussing non-commutative geometry in quantum mechanics. The idea of a weak value has returned to prominence due to Aharonov, Albert and Vaidman showing how they can be measured. They are not eigenvalues of the system and can not be measured by a collapse of the wave function with the traditional Von Neumann (strong) measurement which is a single stage process. In contrast the weak measurement process has three stages; preselection, weak stage and finally a post selection. Weak values have been observed using photons and neutrons and we are building an experiment to observe them in atomic systems of helium, neon and argon. We are using a method which is a variant on the original Stern-Gerlach experiment. The design, simulation, realisation and results of the experiment will be presented.

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