

Abstract Submitted
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The weak measurement process and the weak value of spin for metastable helium 2^3S_1 VINCENZO MONACHELLO, PETER BARKER, ROBERT FLACK, Univ Coll London, BASIL HILEY, Birkbeck, Univ of London — An experiment is being designed and constructed in order to measure the weak value of spin for an atomic system. The principle of the “weak measurement” process was first proposed by Aharonov, Albert and Vaidman [1], and describes a scenario in which a system is weakly coupled to a pointer between well-defined pre- and post-selected states. This experiment will utilise a pulsed supersonic beam of spin-1 metastable Helium (He^*) atoms in the 2^3S_1 state. The spin of the pre-selected He^* atoms will be weakly coupled to its centre-of-mass. During its flight, the atomic beam will be prepared in a desired quantum state and travel through two inhomogeneous magnets (weak and strong) which both comprise the “weak measurement” process. The deviation of the post-selected $m_s = +1$ state as measured using a micro-channel plate, phosphor screen and CCD camera setup will allow for the determination of the weak value of spin. This poster will report on the methods used and the experimental realisation.

References

- [1] Aharonov Y, Albert D Z and Vaidman L 1988 *Phys. Rev. Lett.* **60** 1351-54

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