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The Construction and Properties of an AC-MOT MELISSA ANHOLM, University of British Columbia, H. NORTON, R.M.A. ANDERSON, O. THERIAULT, J. DONOHUE, J.A. BEHR, TRIUMF — Magneto-Optical Traps (MOTs) have long been used to produce samples of cold trapped neutral atoms, which can be used in the measurement of a variety of physical quantities and theories. Until recently, one limitation of this type of trap was the necessity for the presence of a relatively large magnetic field which would decay only slowly after the trapping mechanism was turned off. This residual magnetic field is expected to partially destroy any atomic polarization induced, for example, by optical pumping. As a result, the precision of any physical measurement which requires polarization is limited. We will discuss the construction of our version of a newer type of MOT, the AC-MOT (originally developed by Harvey and Murray, PRL 101, 173201 (2008)), which is designed specifically so as to minimize residual magnetic fields. We have found that our AC-MOT has lifetimes and cloud sizes similar to those we measured in our DC-MOT. We intend to use a trap similar to this in upcoming nuclear beta decay parity-violation measurements.

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