Abstract Submitted
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Magnetic Field Control and Stabilization Using a Current Transducer and the Applications for Optically Trapped Atoms[1] C. WELFORD, M. JUNKER, D. DRIES, J. HITCHCOCK, Y. P. CHEN, R. G. HULET, Department of Physics and Astronomy, Rice University — Magnetic fields created by driving current through coils are used both to provide the trapping force in magnetic traps such as Ioffe-Prichard traps and as a means to control the atomic interactions in optical-dipole traps via Feshbach resonances. Field stability is important to achieve accurate measurements, since the resonant atomic frequency varies with field, as does the atomic scattering length. In addition, the ability to rapidly change the magnetic field has various applications in experiments using Feshbach resonanaces. A means for improving the current stability and rate of change has been implemented using a current transducer, by precisely measuring the current and providing feedback to a controlled FET. The bandwidth has been measured at 6 kHz and the device will be characterized to ensure there is no noise near trapping frequencies, which would otherwise cause heating and loss from the trap.

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