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# Experimental realisation of a magneto optical trap of Rb-85 – cold atoms

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Magneto-optical trapping (MOT) is a standard tool for the creation of cold atom. The development of cold atom experiments has led to the advancement of many fields, which includes high precision metrology [1], atomic and molecular physics [2, 3] as well as atom optics [4]. Magneto- optical trapping is implemented by using the combination of on-resonant laser cooling techniques, to provide a velocity dependent force and magnetic trapping, to provide a position dependent force. This allows for the confinement of atomic samples with a relatively large number of atoms (108 atoms for a standard setup) at an extremely low temperature (in the μK range) in a locally small volume of space [5].

Here we present, the experimental realisation of a cold atom trap in a MOT configuration, which was implemented at the University of KwaZulu-Natal, Quantum Research Group, South Africa. It involves laser cooling and trapping of Rb-85 atoms by means of a three beam retro-reflected MOT. The experimental system comprises of the following sub-systems: a vacuum system in which the cooling and trapping takes place in a 6 beam configuration, a laser system which provide the optical power for cooling, a magnetic field which creates a trapping force for the atom and an imaging system which can be used to determine the properties of the atomic cloud. An overview of these systems will be presented as well as the experimental results of creating a MOT for trapping Rb-85 atoms.

References

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## Apply to be<br> considered for a student <br>   award (Yes / No)?

No

## Level for award<br> (Hons, MSc, <br>   PhD, N/A)?

N/A

## Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?

Yes

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