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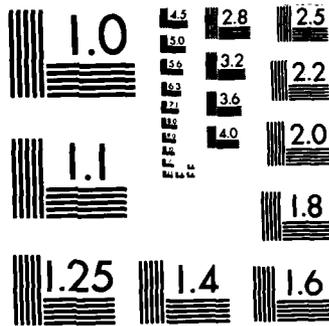
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ANNUAL SUMMARY REPORT

Forces on Neutral Atoms Due to Electromagnetic Fields

Office of Naval Research  
Contract N00014-83-K-0695

covering the period  
1 September 1984 - 31 August 1985

Submitted by:  
David E. Pritchard

23 October 1985

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
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Cambridge, Massachusetts 02139

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ONR Progress Report 1 September 1984 - 31 August 1985

The major portion of our effort in 1984-1985 has gone into design and construction of a new large bore (3<sup>1/2</sup><sub>in.</sub>) atom slower and trap which will use cryogenics both to produce ultra-low vacuums and to enable use of superconducting magnet technology. The vacuum and cryogenic dewar is under construction, the longitudinal magnets have been built (by us - after an unsuccessful attempt to find outside suppliers), and the trap magnet has been successfully tested. Considerable effort was also devoted to major renovations of our laboratory space including installation of a 18<sup>1/2</sup><sub>in.</sub> hole to the newly acquired laboratory space below our laser lab - this will permit use of a vertical configuration for the apparatus, which is roughly 5 meters long. We hope to begin experiments on steady state slowing by Christmas. Early in the period some effort was devoted to measurements on slowing atoms in a magnetic slower using conventional magnets which we built in 1983-84.

Invited talks on trapping neutral atoms were given at the Gordon Conference on Spin Aligned Systems and at the International Conference on Physics of Electron and Atomic Collisions. Papers published include an article in Quantum Electronics and a contribution to the ICPEAC book of invited talks.



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