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Laser frequency stabilization using saturated absorption spectroscopy and magneto-optical trap of Rubisium in glass cell.

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In order to measure the electron's electric dipole moment (eEDM), a sufficient number of atoms must be trapped to reduce statistical uncertainty. In particular, to realize it, stabilizing laser frequency is required.
In this experiment, saturated absorption spectroscopy (SAS) was employed with
techniques of frequency modulation spectroscopy (FMS) and modulation transfer spectroscopy (MTS) to extract signals which are essntial for controlling laser frequency. The signals from SAS were processed via a servo circuit and the feedback signals were transfered to a piezoelectric device which manipulates the frequency. Moreover, magneto-optical trap (MOT) was implemented with the frequency-stabilized laser, and 87Rb atoms were successfully trapped in a glass cell.
We will report an overview of the entire stabilization system, and a quantitative
evaluation of the number of trapped atoms in this presentation.

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