Abstract Submitted
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Robust laser frequency locking by dispersion of atoms in a transverse magnetic field TARO HASEGAWA, MITSUYASU DEGUCHI, Keio University — A robust laser frequency locking scheme to an atomic transition is proposed and experimentally demonstrated. In this scheme, dispersion (real part of electric susceptivity) of the Zeeman-shifted atoms is employed as an error signal for feedback, whereas in the DAVLL (dichroic atomic vapor laser lock, Appl. Opt. **37**, 3295(1998)), absorption (imaginary part of electric susceptivity) is. Magnetic field transverse to the laser beam is applied to the atoms. The error signal of the proposed scheme provides a wide locking range, depending on the parameters and the energy level structure. Experimental demonstration with transition between $5d\ ^2D_{3/2}$ and $6p\ ^2P_{1/2}$ of Ba^+ is carried out for a grating-feedback external-cavity laser diode at 650 nm.

Taro Hasegawa
Keio University

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