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Development of a high intensity laser for efficient spin exchange optical pumping in a spin maser measurement of the ^{129}Xe EDM CHIKAKO FUNAYAMA, Tokyo Tech, TAKESHI FURUKAWA, Tokyo Metropolitan Univ., TOMOYA SATO, Tokyo Tech, YUICHI ICHIKAWA, RIKEN Nishina Center, YUICHI OHTOMO, YU SAKAMOTO, SHUICHIRO KOJIMA, TAKAHIRO SUZUKI, MASATOSHI CHIKAMORI, ERI HIKOTA, MASATO TSUCHIYA, Tokyo Tech, AKIHIRO YOSHIMI, Okayama Univ., CHRISTOPHER BIDINOSTI, Univ. of Winnipeg, TAKASHI INO, KEK, HIDEKI UENO, RIKEN Nishina Center, YUKARI MATSUO, Hosei Univ., TAKESHI FUKUYAMA, RCNP, Osaka Univ., KOICHIRO ASAHI, Tokyo Tech — We aim to search for an atomic electric dipole moment (EDM) in ^{129}Xe beyond the present upper limit at the level of 10^{-28} $e$cm. The enhancement of the spin polarization through the efficient spin-exchange optical pumping process is important for stable maser operation. Previously, a distributed feedback (DFB) laser and a spatially separated tapered amplifier (TA) were used for the optical pumping. The characteristics of the TA-DFB laser, such as its narrow line width and high frequency stability, enable us to produce a large spin polarization. However, the power of the TA-DFB laser was not sufficient for stable operation of the ^{3}He spin-maser comagnetometer. Recently, we have been preparing a new laser system containing an external cavity laser diode (ECLD) and a more intense TA for more efficient pumping. In the presentation, we discuss the Rb and noble gases polarizations achieved with our new ECLD compared to that with the DFB laser, and evaluate the advantages gained by employing the ECLD.

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