

Abstract Submitted  
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**A  $^{129}\text{Xe}$  active spin maser with digitalized feedback<sup>1</sup>** TAKESHI INOUE, Tokyo Institute of Technology, AKIHIRO YOSHIMI, RIKEN, MAKOTO UCHIDA, TAKESHI FURUKAWA, NAOTO HATAKEYAMA, MASATO TSUCHIYA, HIRONORI HAYASHI, KOICHIRO ASAHI, Tokyo Institute of Technology — Observation of non-zero value for an electric dipole moment (EDM) will imply the  $T$ -violation and hence the  $CP$ -violation. We plan to search an EDM in a  $^{129}\text{Xe}$  atom. Experimentally, the EDM is deduced from a measured shift in frequency of the spin precession which occurs upon the reversal of an electric field applied. The shift should be extremely small so that a high precision of frequency, and hence a long precession time, are essential for the EDM search. This is where our active spin maser comes in. An active spin maser we are developing is a scheme in which the spin precession is maintained by applying the feedback field externally generated according to an optically detected spin precession signal. By using this scheme, the frequency precision of 9.3 nHz has been obtained for a measurement time of 30,000 s duration. We report on recent construction of a renewed Maser setup which employs a computer-based digitalized feedback system.

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