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**Nuclear spin maser at low frequency and atomic EDM of  $^{129}\text{Xe}$**   
AKIHIRO YOSHIMI, RIKEN, KOICHIRO ASAHI, Tokyo Inst. Tech., MAKOTO UCHIDA, SACHIKO OSHIMA — A search for electric dipole moment (EDM), which indicates a direct evidence for the violation of time reversal symmetry, is one of the important sites for studying the origin of CP violation. The standard model predicts the EDM value of 5-6 orders smaller than present experimental upper limits, while predictions of the non-standard models such as supersymmetry are not far from the upper limit. In order to perform the search for atomic EDM of  $^{129}\text{Xe}$ , we have developed nuclear spin maser with optically pumped  $^{129}\text{Xe}$ , which operates at a low magnetic field of mG by using sensitive optical detection of nuclear precession and feedback system of the transverse oscillating field which is synchronism with the spin precession. This low frequency nuclear spin maser which involves the artificial feedback system enables us to measure a continuous nuclear spin precession at a stabilized low magnetic field, and thus the determination frequency precision of spin precession can be dramatically improved. We have developed an atomic magnetometer with Rb and a stabilized current source for the magnetic field control to continuously operate the spin maser under highly stabilized magnetic field. We will report on performance of the new type of nuclear spin maser especially on the frequency stability, and feasibility for EDM search with the experimental sensitivity of 1-2 orders better than the present ones.

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