

# Development of dual-species spin maser of $^{129}\text{Xe}$ and $^{131}\text{Xe}$ toward the EDM measurement

Wednesday, 9 August 2023 14:55 (5 minutes)

We search for the Electric Dipole Moment (EDM) of Xe atoms using a technique of an artificial-feedback nuclear spin maser. In this study,  $^{129}\text{Xe}$  and  $^{131}\text{Xe}$  are used to deduce the isotope-differential EDM as well as to work as comagnetometry. The isotope-differential EDM is deduced from the difference of the precession frequency between  $^{129}\text{Xe}$  and  $^{131}\text{Xe}$  under a magnetic field and an electric field. The spin maser sustains the precession of the Xe spins through the optical detection of the precession and the artificial processing of the signals, enabling long-duration measurements of the frequency. The spin maser apparatus has been established and developed at Kyushu University. Because the frequency uncertainty of the spin maser is mainly limited by the instability of the optical systems currently, we are developing the stabilized operation of the lasers. Furthermore, we study the optimization of the fabrication of the cell containing the Xe atoms by evaluating the spin polarization and relaxation of the Xe spins. In this presentation, the current status of the developments of the spin maser and the evaluation of the spin polarization and relaxation of the spins of  $^{129}\text{Xe}$  and  $^{131}\text{Xe}$ , will be given.

## Presentation type

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**Session Classification:** Short presentation for poster contributions