Precision magnetic measurement in spin-exchange optically pumping rubidium-^{129}Xe system

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The precise measurement of weak magnetic fields using high-sensitivity magnetometers promotes the progress and development of many research fields. Recently, we develops a rubidium-xenon vapor cell atomic magnetometer. ^{129}Xe atoms are polarized by spin exchange collisions with rubidium atoms, which are pumped with a circularly polarized laser beam. Based on the rubidium-^{129}Xe system, we realize a nuclear-spin-based magnetometry with high magnetic-field precision. In particular, we develop a new type of nuclear-spin maser, which is based on the transition between Floquet states. The demonstrated Floquet-state maser Floquet-state maser is promising for operating as an ultralow-frequency magnetic field sensor. This kind of sensitive sensor implies a promising application in exotic physics.

References

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