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Longitudinal relaxation time measurement for 129Xe in NMR gas cells with Rabi oscillation[1] RUI ZHANG, ZHIGUO WANG, National University of Defense Technology, XIANG PENG, HONG GUO, Peking University — NMR oscillator based on 129Xe in NMR gas cells is a good probe to test the nEDM, in which both the longitudinal and transverse relaxation times are key parameters. We present a method to measure the longitudinal and transverse relaxation times simultaneously with high speed. Because longitudinal relaxation leads to a damp of the Rabi oscillation of the 129Xe ensemble and the damping factor is a function of longitudinal relaxation time, the longitudinal relaxation time can be obtained with Rabi oscillation information. Besides, when stimulating magnetic field is removed, the 129Xe spin polarization damps with a time constant of transverse relaxation time. The method can be used to measure the relaxation times of 129Xe nuclei spins quickly.

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