

Abstract Submitted
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Relaxations in few-body systems YASUSHI KONDO, Kindai Univ.

— We have been interested in relaxation and its suppression from the view point of quantum information processing [1, 2]. Relaxation of a system may be interpreted as a one-way flow of information from this system to an environment of which degrees of freedom is infinite. We realize two controlled relaxations of a spin (our system) in a not-so-large molecule by using liquid-state NMR techniques. Our information is the coherence of the spin. In the first experiment, an information flow is controlled by introducing a wall that absorbs the information. We realize this wall by using an external stochastic field generated by magnetic impurities added in solvent. In the second one, we employ a molecule of which structure is very asymmetric, such as DSS (4,4-dimethyl-4-silapentane-1-sulfonic acid). Here, the system is a Si-spin in DSS, while the environment is the rest of spins of which number is only 16. The degrees of freedom of this environment is not infinitely large, but may be large enough to pretend to an open one. [1] Y. Kondo, et al, J. Phys. Soc. Jpn. **76**, 10 (2007). [2] Y. Kondo, et al, New J. Phys. **18**, 013033 (2016).

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