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Magnetization dynamics of two interacting spins in an external magnetic field WILLIAM COFFEY, Dept. Electronic & Electrical Engineering, Trinity College, Dublin 2, Ireland, HAMID KACHKACHI, Lab. Magnétisme et d'Optique, Université de Versailles St. Quentin, YURI KALMYKOV, Université de Perpignan, 52 Avenue Paul Alduy, 66860 Perpignan Cedex, France, SERGEY TITOV, Institute of Radio Engineering and Electronics of the Russian Academy of Sciences, Fryazino, 141190, Russia — The longitudinal relaxation time of the magnetization of a system of two exchange coupled spins subjected to a strong magnetic field is calculated exactly by averaging the stochastic Gilbert-Landau-Lifshitz equation for the magnetization, i.e., the Langevin equation of the process, over its realizations so reducing the problem to a system of linear differential-recurrence relations for the statistical moments (averaged spherical harmonics). The system is solved in the frequency domain by matrix continued fractions yielding the complete solution of the two spin problem in external fields for all values of the damping and barrier height parameters. The magnetization relaxation time extracted from the exact solution is compared with the inverse relaxation rate from Langer's theory of the decay of metastable states [J. S. Langer, Ann. Phys. (N.Y.) **54**, 258 (1969)], which yields in the high barrier and intermediate-to-high damping limits the asymptotic behavior of the greatest relaxation time.

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