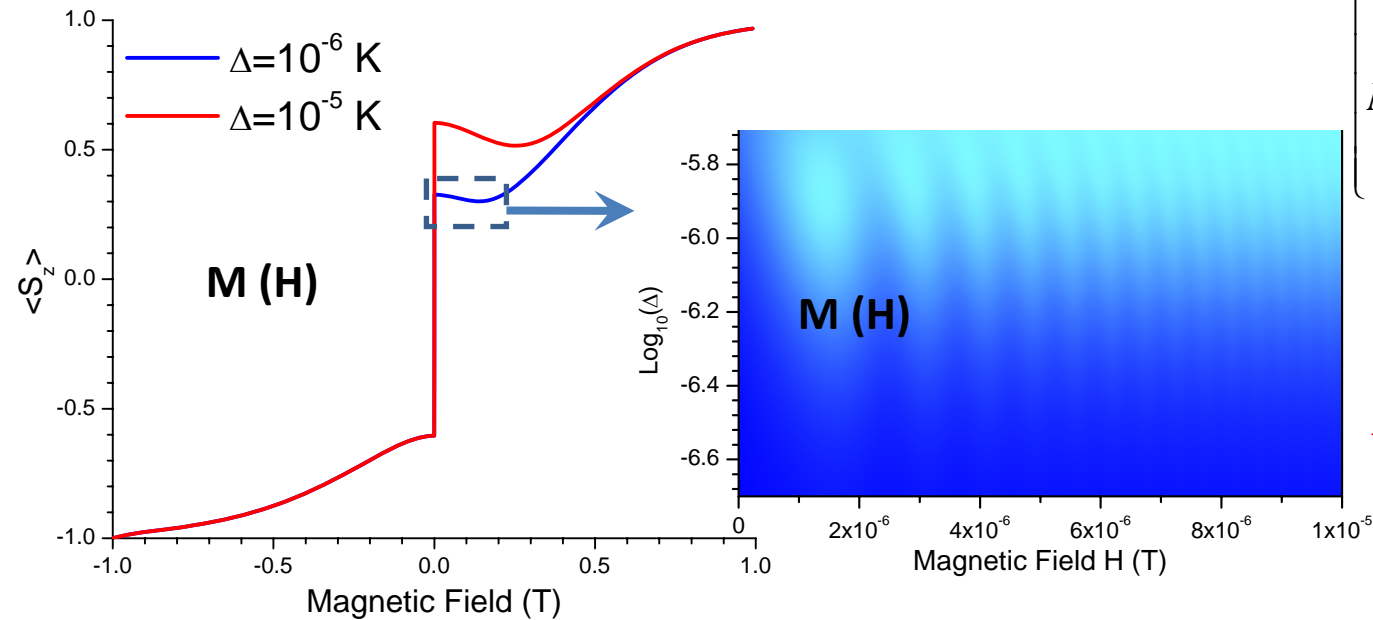


# Coherent spin rotation in the presence of a phonon-bottleneck effect

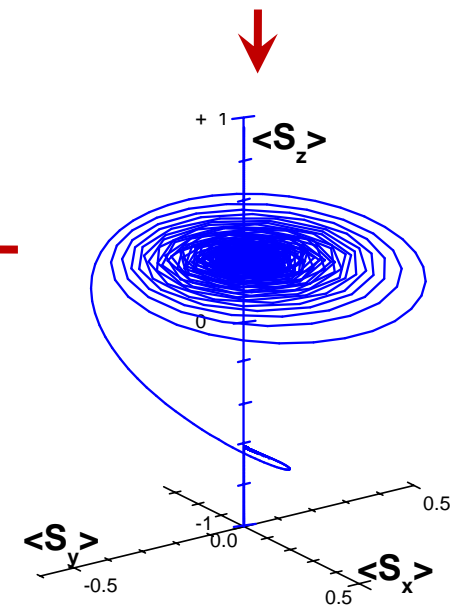
L. Chen & I. Chiorescu, *EPL* **87**, 57010 (2009)

We address the need for a model that blends non-adiabatic quantum transitions with spin relaxation due to a non-equilibrium phonon bath. For that, we blend a Landau-Zener problem and a phonon-bottleneck one, into a set of phenomenological Bloch-type equations. The resulting spin dynamics shows both non-equilibrium hysteresis and coherent oscillations.



$$\frac{\partial \rho}{\partial t} = -\frac{i}{\hbar} [H(t), \rho(t)]$$

$$\begin{cases} \dot{M}_{x'} = \frac{\Delta_H}{\hbar} M_{y'} - M_{z'} \dot{\theta} - \frac{M_{x'}}{T_2} \\ \dot{M}_{y'} = -\frac{\Delta_H}{\hbar} M_{x'} - \frac{M_{y'}}{T_2} \\ \dot{M}_{z'} = M_{x'} \dot{\theta} + \frac{M_{z'}^{eq}}{M_{z'}} \frac{M_{z'}^{eq} - M_{z'}}{\tau_H} \end{cases}$$



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