Detection of quantum entanglement using cross-correlation spin noise spectroscopy

DIBYENDU ROY, Max Planck Institute for the Physics of Complex Systems, NIKOLAI A. SINITSYN, Theoretical Division, Los Alamos National Laboratory — Nature of spin-spin correlations between two interacting spin subsystems in thermal equilibrium can be probed using cross-correlation spin noise spectroscopy [1] with two linearly polarized off-resonant laser beams of different wavelength. Here we propose to use such cross-correlator of spins to detect and quantify quantum correlations such as quantum entanglement between the spin subsystems. We demonstrate our proposal for interacting quantum dots.