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Coherent optical control of correlation waves of spins in semiconductors ERAN GINOSSAR, Yale University, YEHOSHUA LEVINSON[1], SHIMON LEVIT, Weizmann Institute of Science — We calculate the dynamical fluctuation spectrum of electronic spins in a semiconductor under a steady-state illumination by light containing polarization squeezing correlations. Taking into account quasiparticle lifetime and spin relaxation for this non-equilibrium situation we consider up to fourth order optical effects which are sensitive to the squeezing phases. We demonstrate the possibility to control the spin fluctuations by optically modulating these phases as a function of frequency, leading to a non-Lorentzian spectrum which is very different from the thermal equilibrium fluctuations in n-doped semiconductors. Specifically, in the time-domain spin-spin correlation can exhibit time delays and sign flips originating from the phase modulations and correlations of polarizations, respectively. For higher light intensity we expect a regime where the squeezing correlations will dominate the spectrum.

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