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Probing Spin Glass via conductance fluctuations GUILLAUME PAULIN, DAVID CARPENTIER — In this work we study numerically conductance fluctuations in a low temperature Spin Glass nanowire. In the Spin Glass phase, frozen classical spins dephase the electrons diffusing in the sample. The phase of electrons will then keep track of this encountered configuration. We show numerically that a careful study of conductance correlations between these two different frozen configurations of spins S1 and S2 gives access to intrinsic properties of the Spin Glass, such as spin configurations overlap that encodes how different the configurations are. The onsite disorder potential in the system, described by an Anderson model, has two origins: a scalar one due to the presence of impurities without spin and a magnetic one due to the presence of magnetic impurities. Many configurations of scalar disorder are taken into account to perform averages, but only a few spin configurations are created. The numerical method is based on the Landauer formalism of transport to deduce the conductance of a diffusive sample from the scattering matrix, and on a relation due to Fisher and Lee that relates the scattering matrix to the retarded Green's functions of electrons.

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