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Dissipative dynamics of vortices in a spiral state and transport in the spin-glass phase of $La_{2-x}Sr_xCuO_4$ V. JURICIC, Institute for Theoretical Physics, Univ. of Utrecht, L. BENFATTO, Dept. of Physics, Univ. of Rome "La Sapienza", Italy, A.O. CALDEIRA, Inst. of Physics, Univ. of Campinas, Brazil, C. MORAIS SMITH, Institute for Theoretical Physics, Univ. of Utrecht
— Doping of an antiferromagnet with holes may lead to a spiral rearrangement of the spins, as it has been argued by Shraiman and Siggia. The formation of a spiral is consistent with the incommensurate magnetic order observed by the neutron scattering experiments in the spin-glass phase of $La_{2-x}Sr_xCuO_4$. The spiral state has a chiral degeneracy that leads to the formation of topologically nontrivial vortex-like defects. We propose that the dissipative dynamics of these defects is responsible for the transport properties in the spin-glass phase of cuprates [1]. Using the collective-coordinate method, we show that the defects are coupled to a bath of magnons. The resulting effective action, after the magnons have been integrated out, indicates that the motion of the defects is damped due to the scattering by the magnons. Assuming that the holes are attached to the vortices, we have calculated the corresponding in-plane resistivity, which exhibits an anisotropy and linear temperature dependence in agreement with experimental data. References: [1] V. Juricic, L. Benfatto, A. O. Caldeira, and C. Morais Smith, Phys. Rev. B **71**, 064421 (2005).

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