Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Dynamics of Thermal Effects in the Spin-Wave Theory of Quantum Antiferromagnets ANGEL RIVAS, MIGUEL A. MARTIN-DELGADO, Universidad Complutense de Madrid — The main propose of this work [1] is to study the dynamics of quantum antiferromagnets due to the interaction with a thermal environment. To this end we resort to the spin wave theory which has become by now an standard and reference tool in order to have a good approximate description of quantum antiferromagnetic systems in appropriate dimensions. We derive a master equation that allows us to study non-equilibrium dynamics due to the thermal bosons in the environment, and give closed analytic form for the magnon decay rates. Moreover, we show that these ones turn out to be closely related to form factors, which are experimentally accessible by means of neutron and Raman scattering. Furthermore, we compute the time-evolution of the staggered magnetization showing that, for moderate temperatures, the magnetic order is not spoilt even if the coupling is fully isotropic. As far as we know, this is a fundamental aspect of spin wave theory that has remained unexplored. We expect this presentation may be interesting for a broad audience as it is at the crossroads of strongly correlated systems and the physics of quantum open systems, that is so much rooted in quantum information theory.

[1] A. Rivas and M.A. Martin-Delgado, Ann. Phys. (N.Y.) (in press), and arXiv:1112.315.

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Date submitted: 06 Nov 2012 Electronic form version 1.4