

## Quantum Physics

# Stochastic resonance phenomena in spin chains

Ángel Rivas, Neil P. Oxtoby, Susana F. Huelga

(Submitted on 13 Jan 2009 (v1), last revised 14 May 2009 (this version, v2))

We discuss stochastic resonance-like effects in the context of coupled quantum spin systems. We focus here on an information-theoretic approach and analyze the steady state quantum correlations (entanglement) as well as the global correlations in the system when subject to different forms of local decoherence. In the presence of decay, it has been shown that the system displays quantum correlations only when the noise strength is above a certain threshold. We extend this result to the case of a Heisenberg XYZ exchange interaction and revise and clarify the mechanisms underlying this behaviour. In the presence of pure dephasing, we show that the system always remains separable in the steady state. When both types of noise are present, we show that the system can still exhibit entanglement for long times, provided that the pure dephasing rate is not too large.

Comments: 11 pages, 7 colour figures. Published version  
Subjects: **Quantum Physics (quant-ph)**; Superconductivity (cond-mat.supr-con)  
Journal reference: Eur. Phys. J. B 69, 51 (2009)  
DOI: [10.1140/epjb/e2009-00108-5](https://doi.org/10.1140/epjb/e2009-00108-5)  
Cite as: [arXiv:0901.1791v2](https://arxiv.org/abs/0901.1791v2) [quant-ph]

## Submission history

From: Neil Oxtoby [[view email](#)]

[v1] Tue, 13 Jan 2009 14:20:33 GMT (1097kb)

[v2] Thu, 14 May 2009 16:40:04 GMT (1098kb)

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