

Quantum Physics

Gauge Boson Theory of Quantum State Reduction

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(Submitted on 31 Dec 2008)

A theory of quantum state reduction is advanced. It is based on two principles: (1) Gauge decomposition; (2) Maximum entropy. To wit: (1) The reduction decomposition of a state vector is the Schmidt decomposition with respect to the states of a set of (dressed) gauge boson modes; (2) The reduction instant is that of the maximum entropy of a resulting mixed state. The theory determines states undergoing the reduction, its instant, resulting pure states and their probabilities. Applications: (Polarized) photon absorption and transmission, emission, particle detection, reduction of a superposition of states, nonintegral photon states, photon and matter-photon entanglement, processes with weak bosons, and the role of gluons.

Comments: 16 pages, LaTeX 2e

Subjects: **Quantum Physics (quant-ph)**Cite as: **arXiv:0901.0122v1 [quant-ph]**

Submission history

From: Vladimir Mashkevich [[view email](#)]**[v1]** Wed, 31 Dec 2008 17:26:13 GMT (9kb)*[Which authors of this paper are endorsers?](#)*

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