



SFB 631

Festkörperbasierte Quanteninformationsverarbeitung



Seminar Announcement

Location Walther-Meissner-Institut
Seminarraum 143

Time Friday, 11.02.2005
11:00 Uhr st

Speaker Dr. Kenneth R. Brown
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Title Deterministic optical Fock-state generation

Abstract We present a scheme for the deterministic generation of N-photon Fock states from N three-level atoms in a high-finesse optical cavity. The method applies an external laser pulse that generates an N-photon output state while adiabatically keeping the atom-cavity system within a subspace of optically dark states. We present analytical estimates of the error due to amplitude leakage from these dark states for general N, and compare it with explicit results of numerical simulations for $N \leq 5$. The method is shown to provide a robust source of N-photon states under a variety of experimental conditions and is suitable for experimental implementation using a cloud of cold atoms magnetically trapped in a cavity. The resulting N-photon states have potential applications in fundamental studies of nonclassical states and in quantum information processing.

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