



QUANTUM OPTICS SEMINAR

Title: Deterministically controlled emission of photons from a single ion

Speaker: Prof. Wolfgang Lange, University of Sussex, United Kingdom

Time: Friday, May 13, 2005 at 11:15

Place: Phys.Aud.

Abstract:

The controlled production of single photons from a single emitter is a process of fundamental importance for the manipulation of quantum states of light. It provides a coherent interface between the internal quantum states of an atom and propagating photonic states.

At the Max-Planck Institut für Quantenoptik, we have localized a single calcium ion in a linear radiofrequency trap and coupled it to the electromagnetic field of an optical resonator. With fluctuations of the ion-field interaction below 2%, we have generated controlled single-photon pulses, triggered by an external pump pulse. The temporal structure of each photon is determined by the shape of the pump pulse. Single photons were continuously observed at the output port of the cavity for up to 90 minutes.

This is an important step towards realizing quantum information processing in a distributed network of trapped ions, interconnected through long-distance photonic channels.

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