

느린 빛, 빠른 빛, 정지한 빛 (양자메모리 응용)

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Atom-photon interactions play prominent roles in long distance quantum networks, e.g., in applications involving flying photonic qubits, quantum memory, and quantum repeaters. In this colloquium, I will introduce the experimental results about the superluminal phenomenon, 10,000 times faster than the speed of light in a vacuum, and slow light that is 10,000 times slower than the speed of light. Furthermore, I will show the experimental results of the storage of light information in an atomic medium. In particular, quantum memory is a key technology for long-distance quantum communication, photonic quantum information networks, and on-demand single-photon sources. The quantum memory of the photonic quantum state has been intensively studied in atomic media with atomic coherence. Quantum memory is based on preservation of quantum properties such as entanglement, qubits, and photon statistics of the stored light.