Quantum Optics Seminar

Title: Squeezing and entanglement in the ground state spin subsystems of macroscopic atomic ensembles

Speaker: Dr. D. V. Kupriyanov, State Polytechnical University, St. Petersburg, Russia

Time: Friday, May 2, 2003 at 13:00

Place: 520-732

Abstract:

The cooperative Raman-type scattering of correlated photon pairs on the spin-oriented atoms can be a mechanism to create the macroscopic quantum states in the ground state spin subsystems of atomic ensembles. It seems accessible for existing experimental setups based on magneto-optic traps confining the alkali atoms. Such an "optical pumping" method can be applied for macroscopic but not optically dense medium with the number of atoms up to 109. The observation of the quasi-spin squeezing or entanglement can be done with Mach-Zehnder type interferometer. As far as the optical interaction is weak and has a short duration, there will be no light induced acceleration effects in the proposed schemes of squeezing and entanglement.

Eugene Polzik