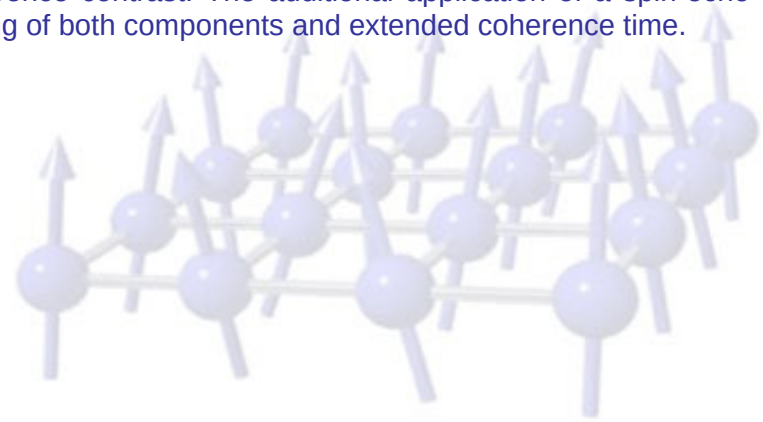
SFB/TRR 21 - Seminar
26. Mai 2010, Ulm

Andrei Sidorov
(Swinburne University of Technology, Melbourne, Australia)

Reversing and rephasing the nonlinear dynamics of two-component Bose-Einstein condensates

Knowledge of the phase dynamics in matter waves is the critical factor in studying coherent properties of Bose-Einstein condensates (BECs) for potential applications of BEC interferometers. Our two-component system is comprised of two hyperfine ground states of quantum degenerate Rubidium-87, magnetically trapped on an atom chip and interrogated via two-photon Ramsey interferometry. We observe an interesting spatial evolution of the condensate phase which leads to inhomogeneous dephasing of the condensate wavefunction along the axial direction and to the loss of Ramsey fringes. We also observe that collective oscillations of the condensate produce periodical recovery of the interference contrast. The additional application of a spin-echo pulse leads to rephasing of both components and extended coherence time.



26. Mai 2010, 14:00 Uhr

Universität Ulm, Raum 45.2.103 (Uni West)
Albert-Einstein-Allee 11, 89081 Ulm

CO.CO.MAT