SFB/TRR 21 - Seminar

27. Juni 2012, Stuttgart

Thomas Lauprêtre
(Laboratoire Aimé Cotton, Université Paris Sud XI, Orsay Cedex, France)

Coherent processes in metastable helium at room temperature

Light-matter interactions in 3 or 4 level systems give rise to many interesting phenomena. For example, electromagnetically induced transparency phenomenon (EIT) can make a 3 level lambda system transparent at a wavelength for which it is otherwise opaque. A direct consequence is the possibility to change the group velocity in this medium. We are thus able to observe with our experimental set-up the phenomena of Slow-Light or Fast-Light. It is even possible to obtain negative group velocities. To increase the sensitivity of optical sensors such as laser gyros, it was proposed to introduce such dispersive medium inside an optical cavity. Under these conditions, the lifetime of photons inside the cavity is an important parameter. But opinions differ as to whether it depends on the group or phase velocity. The experimental and theoretical results I present here concern the measurement of this lifetime under different conditions in order to answer this question. Other recent results in a 3 level system excited with linear polarizations have shown very interesting behaviour. Ultra-narrow resonances can appear due to the coherent population oscillations (CPO) phenomenon. I will also present some results we obtained in a 4 level tripod system, as it opens opportunities to explore new interference processes for fundamental studies and possible applications.

27. Juni 2012, 10:00 Uhr

Universität Stuttgart, NWZII, Raum 3.123
Pfaffenwaldring 57, 70569 Stuttgart

CO.CO.MAT