SFB/TRR 21 - Seminar
4. Mai 2012, Stuttgart

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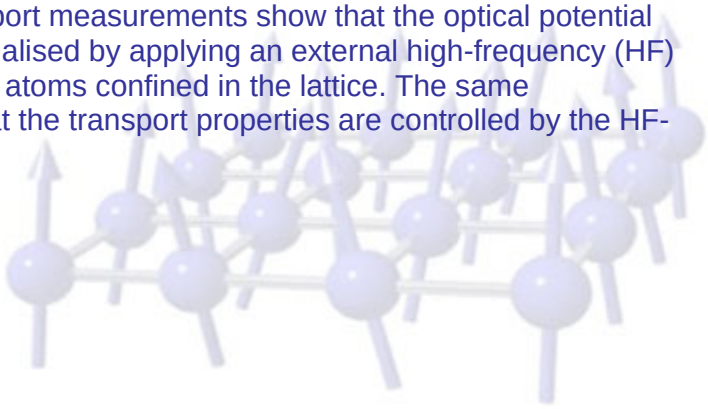
Renormalisation of an Optical Lattice by High Frequency Modulation

The control of transport is a recurrent topic in physics, chemistry, and biology. A typical scenario corresponds to particles diffusing on a periodic substrate, with transport controlled by the application of external dc and ac fields. The ultimate limit for the control of transport is often the impossibility of tuning the periodic potential, as it is usually the case in solid states. Recently, the so-called vibrational resonance (VR) mechanism was proposed, that in principle allows to overcome this limitation.
To proof this prediciton, the phenomenon of VR is investigated experimentally using a dissipative optical lattice for cold Rb-atoms as model system. Transport measurements show that the optical potential can indeed be renormalised by applying an external high-frequency (HF) oscillating field on the atoms confined in the lattice. The same experiments show that the transport properties are controlled by the HF-field.



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