SFB/TRR 21 - Seminar

16. December 2013, Stuttgart

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A home-built high-power Ytterbium fiber amplifier at 1064 nm for optical lattice applications

The Innsbruck Rb-Cs mixture experiment focuses on the creation of a bosonic quantum gas of dipolar RbCs ground-state molecules using Feshbach association and subsequent stimulated adiabatic Raman transfer (STIRAP). The long-term goal is to investigate the RbCs ground-state molecules in a three-dimensional optical lattice and to explore novel many-body quantum phases.
In order to create a deep optical lattice potential, high-power narrow-band laser light is needed. One way to achieve this is to amplify the light of a master oscillator using a fiber amplifier system. In my talk I will report on the realization of a home-built Ytterbium-doped fiber amplifier emitting 25W of stable single-frequency diffraction-limited light at 1064 nm, using a 50-W pump laser diode at 975 nm. Moreover, I will give an update about the ongoing work on our RbCs project and present the planned sequence for the preparation of the ground-state molecules in the lattice.

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