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Type: **Poster**

Narrow-linewidth Laser Systems for the 1S0-3P2 and 1S0-3P0 Clock Transitions in Strontium

Saturday, November 26, 2022 4:00 PM (2 hours)

Recent breakthroughs with ultracold-atom-based programmable quantum simulators have started to show the potential of tweezer arrays as a quantum simulation platform.

A promising application is the simulation of many-body systems like the Ising or Hubbard models.

Our goal is to unite these two capabilities in a novel programmable quantum simulator based on the alkaline-earth atom strontium.

A crucial part is realising two-level spin systems based on ultranarrow optical clock transitions. Strontium offers various transitions suited for this purpose. We focus on the 1S0-3P2 clock transition at 671 nm which can be magically trapped by tuning the angle of an applied magnetic field. Additionally, we plan to use the 1S0-3P0 clock transition at 698 nm. This poster presents the generation and stabilization of the 671 nm narrow linewidth laser light. For this purpose, a home-built external-cavity diode laser is frequency-stabilized to an ultrastable reference cavity.

Furthermore, this poster presents the layout for frequency stabilisation of the 698 nm laser light, locked to the same cavity.

Category

Other

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