Institut für Mikroproduktionstechnik

Development of miniaturised rubidium laser stabilisation with integrated optics

Kontakt

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Arbeitsinhalt

Quantum technology is one of the key technologies of the 21st century. By exploiting quantum effects, sensitivity and accuracy can be further increased, opening up new fields of application. A central element of quantum technology is a reliable and stable laser source. The industrialisation of quantum systems requires both miniaturisation and cost reduction of these sources while maintaining high laser quality standards. One approach to stabilising the laser frequency is to ‘lock’ the laser using a control loop that adjusts the laser frequency precisely to the resonance frequency of an atomic rubidium transition. The rubidium required for this is provided by a vapour cell filled with rubidium. Another key point is the integration of optical elements such as waveguides and gratings to enable the optical control loop via the rubidium cell.

The aim of this work is to develop such an integrated laser stabilisation system based on a rubidium reference in a vapour cell and integrated optics. The focus is specifically on the design of the vapour cell, the integrated optics and the coupling of the laser.

Art der Arbeit

Master thesis

Voraussetzungen

- Independent, structured and self-reliant approach to work
- Knowledge of microsystems technology

Starttermin

From now on