

Industrial Master Thesis ESE/Informatik/MST/MSE/SSE

## Laser lock control for photothermal spectroscopy in an industrial environment



Recent developments in photothermal spectroscopy enable spectroscopic measurements in small volumes at high pressure. However, these measurement techniques are based on laser locking methods optimized for laboratory environment. Whether photothermal spectroscopy can be used in industry in the future will depend on whether the control of the laser lock can be designed in such a way that disturbances such as abrupt pressure changes can be compensated.

**Your tasks:** The aim of this work is to control the temperature and the current of a laser in such a way that its wavelength follows the optical resonance of the measuring cell, even if it is strongly detuned by external disturbances. For this purpose, you have to design a suitable control structure, as well as implement it on a micro controller.

**Your skills:** You are experienced in programming microprocessors and analog circuit design. You have followed courses on systems theory and control as well as signal processing.

We offer: Pleasant working environment in a small R&D department embedded in a global company, modern offices and laboratories, and colleagues with strong expertise in laser spectroscopy.

**Note:** This thesis is offered by Endress+Hauser (E+H) a global leader in measurement instrumentation for the process industry. E+H is located in the FRIZ Building at the technical campus of Uni Freiburg. Interested students are asked to contact Dr. Tobias Meinert (tobias.meinert@endress.com).

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