

Bachelor thesis:

Setup and characterization of a Photonic Force Microscope (Optical Tweezers)

The aim of this work is to assemble a new photonic force microscope we got recently and calibrate it. As a first step the optical paths has to be set up and a versatile positioning of the optical components has to be found. The Laser beam has to be guided through the microscope objective and the size and focal lengths must to be adjusted. In a second step the optical paths for the detection have to be adjusted and the quadrant photodiode for beam detection connected and aligned.

As soon as the setup works, the whole system needs to be calibrated. This includes measurement of magnification, trap stiffness, quadrant diode calibration and stability measurement.

As final step the trapping of nanoparticles should be demonstrated and evaluated.

This work includes a variety of different techniques and tasks such as designing, optical adjustment, instrumentation, measurements, data acquisition and evaluation. The theses can be written in English or German.

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