



# Masterthesis

## Development of a robust spectroscopy module for space applications

The locking of LASERs to specific absorption lines is a everyday tool to stabilize LASERs to an absolute frequency. Classical opto-mechanics fails when it comes to space applications with high vibration and thermal loads.

The work is about investigating how to design and manufacture free-optical assemblies when they are exposed to harsh environments (space). Usually these assemblies are built with Zerodur (low CTE), but for the connection of the components different processes are possible (gluing, bonding, soldering). In this particular case, the aim is to build a saturated absorption spectroscopy module.

The task would be as follows:

1. literature research on spectroscopy and the different bonding techniques
2. selection of a process (interconnection technique and fabrication with simple tools) with consideration of advantages/disadvantages etc.
3. CAD design of the assembly
4. development of a manufacturing procedure
5. integration of the module and testing

Further reading:

<https://iopscience.iop.org/article/10.1088/1742-6596/610/1/012039/pdf>

<https://ixnovi.people.wm.edu/documents/PaulStubbsthesis.pdf>

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