V61

He-Ne Laser

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1 Objective

To understand the characteristics of a He-Ne laser, several different configurations are adjusted and their radiation properties measures. This includes the wavelength, intensity distribution, polarization, mode spectrum, as well as the influence of mirror type and resonator length.

2 Background [1]

2.1 Components of a laser

2.2 Processes in the active medium

2.3 Necessity of multiple level systems

2.4 Stability for different resonators

2.5 Transverse and longitudinal modes

2.6 Doppler broadening of the transition

2.7 Brewster windows and polarization

3 Procedure

3.1 Aligning the laser

3.2 Verifying the stability condition

3.3 Observing transverse modes

3.4 Determining the polarization

3.5 Analyzing spectra in multimode operation

3.6 Measuring the wavelength

4 Results

5 Discussion

References

[1] Hans Joachim Eichler, Jürgen Eichler, and Oliver Lux. *Lasers. Basics, Advances and Applications*. Springer Cham, 2018. ISBN: 978-3-319-99895-4. DOI: https://doi.org/10.1007/978-3-319-99895-4.

Appendix