Bachelor thesis review

Yaman Sanajleh

Laser Beam Shaping Technique

The goal of the thesis was to review methods of laser beam shaping for industrial applications and test one of them by reshaping the circular spot to a rectangular spot. Also, to suggest, design and test a way how to control the spot's width for a stable spot's height. The assignment was moderately challenging.

In the theoretical part, the author explains the laser working principle, the behaviour of a gaussian beam, the industrial applications. Also described are methods to obtain a top-hat rectangular spot. Thin lens theory, cylinder lens and lens combinations are presented. The practical part describes the calculations and experiments made: the beam-shaper design, the experimental setup, spot sizes measurements, the zoom feature design and testing.

The student found the relations between lenses' focal lengths, separations and dimensions and the final spot size. Also designed the zoom feature. He proved his findings by experiments. The experimental data differed from the theoretical predictions by a small amount. The author suggested briefly the reasons for that. Here, a more thorough analysis of the discrepancy between the theory and experiment is needed.

The thesis text is logically arranged, bibliography is adequate and correctly cited.

The student had a slow start but then he took the work seriously. I would expect more independent, unaided work, and a smoother application of the theory learned.

I recommend the work for defence and award it by grade

C, good

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Ing. Bc. Šárka Němcová, Ph.D.