

Contents

Introduction	1
Chapter 1. Laser Radar and Laser tracker instrument comparison	7
1.1 LR and LT best fit transformation	7
Chapter 2. Instrumental resolution verification and different target type comparison	13
2.1 Laser radar resolution verification	13
2.2 Different target type comparison	20
Chapter 3. Physical phenomena: plane parallel plate	23
3.1 Snell's Law	23
3.2 Plane parallel plate	26
3.3 Numerical simulation by Zemax	29
Chapter 4. Experimental model and model verification (Laser radar and laser tracker through window test to measure targets apparent position)	32
4.1 Experimental test setup	32
4.2 Methodology for the experimental setup for data verification	34
4.3 Data analysis and model comparison	38
Conclusion	49
References	55

Table index

Table 1: Best fit transformation results and its error propagation	11
Table 2: Best fit transformation results and associated error propagation	21
Table 3. Zemax numerical simulation equations	31

Appendix index

Appendix A. Least squares adjustment	52
Appendix B. Window's specifications	54