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Analysis of MEMS Scanners using Photodiode Test System.

ABSTRACT - Masterthesis

This thesis proposes a test bench to ensure highly accurate and precise angle measurements and jitter measurement to evaluate multiple MEMS mirrors. The MEMS test bench includes an optical receiver circuit with a photodiode to convert the laser beam displacement captured by the photodiode signal conditioning circuit to a mirror scan angle measurement. Jitter and uncertainties in the angle measurement of MEMS mirrors are analyzed considering optical alignment, the circuit response, and calibration data. The setup efficiently measured the angle with 1D mems scanners having 1.5kHz and 17kHz as resonant frequencies. The optical receiving unit achieved jitter of 2.8ns for 17kHz of resonating frequency.