

V. CONCLUSION AND DISCUSSION

In this report, the generator of rotating linearly polarized light using triangular cyclic interferometer were simulated and tested. Jones calculus was employed in mathematical analysis. The experimental results were consistent with simulation outcomes. It yielded a respectable DOP of $96.82 \pm 3.5\%$. The cyclic interferometer was insensitive to external vibration and, hence, a high quality of rotating linearly polarized light was generated and observed. With a minor improvement of the DOP, the system can certainly be applied for the phase retardation measurement for transparent and thin film samples. All of these findings have an implication that our proposed scheme could be used as a reliable system for generating rotating linearly polarized beam.

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REFERENCES

- [1] Azzam RMA, Bashara NM, Ellipsometry and polarized light. North Holland, 1987.
- [2] C. Pawong, R.Chitaree, and C. Soankwan, "The rotating linearly polarized light from a polarizing Mach-Zehnder interferometer production and applications," Optics & Laser Technology, pp.461-468, August 2010.
- [3] C. Pawong, R.Chitaree, and C. Soankwan, "Investigation the use of rotating linearly polarized light for characterizing SiO₂ thin-film on Si substrate," Proc. Of SPOE Vol.8308, pp.830811I-8, December 2011.
- [4] Y. Pavan Kumar., and Sanjib Chatterjee, "Thickness measurement of transparent glass plates using a lateral shearing cyclic path optical configuration setup and polarization phase shifting interferometry," Appl.Opt., pp. 6552-6557, November 2010.
- [5] S. Sarkar, N.Ghosh, S.Chakraborty, and K. Bhattacharya "Self-referenced rectangular path cyclic interferometer with polarization phase shifting," Appl.Opt., pp.126-132, January 2012.
- [6] Y. P. Kumar and S. Chatterjee, "Simultaneous measurement of refractive index and wedge angle of optical windows using Fizeau interferometry and a cyclic path optical configuration," Appl. Opt., vol.48, pp. 4756-4761, August 2009.
- [7] W. H. Steel, Interferometry, Cambridge University, 1983.
- [8] B. Kanseri and H.C.Kandpal, "Mathematical formulation for verification of the Fresnel and Arago interference laws using a Mach-Zehnder interferometer," Optik, pp.1019-1026, December 2008.
- [9] H. Takahashi, C. Masuda, T. Koide, and K. Miyaji, "A rotating linearly polarized light source and its applications for optical measurements," Trans. IECE. Jpn, vol. 69, pp. 157-162, September 1975.