

## THE POTENTIAL OF CELLOPHANE SHEET AS A CHEAP OPTICAL RETARDER

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### ABSTRACT

Birefringence is an inherent optical property of anisotropic materials that enables manipulation of polarization state of light beams for various photonic and optoelectronic applications. In this work, we demonstrate the ability of the cellophane sheet to act as a phase retarder. Results show that the cellophane introduces a phase shift of  $0.98\pi$  radians on the incident beam. By rotating the cellophane sheet on the object beam, the fringe separation is measured for different angles and the values used to calculate the ordinary and extraordinary refractive indices as  $1.4721 \pm 0.0002$  and  $1.4680 \pm 0.0002$  respectively. Because of its sufficient birefringence and small thickness of  $24 \mu\text{m}$ , cellophane can be used to fabricate special polarization pupil masks by cutting and aligning different cellophane structures appropriately.

**Keywords:** - *Birefringence, Cellophane Sheet, Phase Retarder*