Creation and Characterization of **Optically-Switched** Multistable Liquid **Crystal Waveplates**

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Can a beam arbitrarily control the polarization change of another beam?

www.orientdisplav.com

Kutulva et al., 1999

Photoswitching & Setup 1





Photoalignment & Cells 2-4



Variable alignment layer orders the LCs

Realignment at any angle in a complete cell is possible



ERIC



Cheap, simple, yet effective spin coating: education and future research





Is it temperature dependent?



Is it efficient?



Peak transmission shown (i.e., what's useful); opaqueness <0.1%.

Possibly related to:

- Age
- External exposures
- Material (E7 v 5CB)
- Technique (doped v coated)
- Technique (skill)

Microscopy

Color under x-polarizers with λ -plate shows orientation

Tint is due to picture being thru microscope optic

In 3d, the structure twists; colors average to purple

"bubbles" -> inconsistent thickness/fluid distribution

"specks" -> imperfect spin coating



Conclusions & Future Work

	Control Mechanism	Optical Versatility	Stability	Cost
Waveplate	None	None	High	High
Traditional LCD pixel	Electric	Bistable	Medium	Low
Photo switched	Light color	Bistable	Low	Low
Photo aligned	Light polarization	Multistable	Medium	Low

Future work:

- Integrate into quantum optics
- Improve stability
- Model LC cell transition morphology

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Thanks for listening!

Any questions?

