LAB 3 Quantum Eraser

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Polarizer Exercise

① build 2

② setup photodiode terminated $R_L = 100\,k\Omega$
$V_{max} = 275.2\,mV$

③ ⇒ Data recorded on

④ computer

Step 0 Polarizer Orientations

#	Cross pol. angle (deg)
1	90.5°
2	90.
3	86.
4	89.

Quantum Eraser

⑤ polarize HeNe @ 45°

⑥ construct Mach Zehnder interferometer as shown + Beam Walk

⑦ polarizer - vert. oriented at each axis

→ Interference pattern shown
→ photo captured 1:56

⑧ one polarizer horizontal

→ no interference pattern
→ photo captured 1:58

There is no interference pattern as each polarizer "collapses" the wavefunction, forcing the photon into either the horiz. or vert. polarization state.

↳ classically, two orthogonal polarizations do not interfere.

⑨ using pol. #3, placed at output,

angle	outcome	
~90°	no interfere? hard to tell	2:03
~0°	no interfere	2:05
~45	interfere pattern	2:07