Data Analysis

We're given $I_T = cn\varepsilon_0 (E^2)$ and we ha
We want to find n. So.

$E_1 = E_{10}\cos(\omega t - kz_1) \longrightarrow I_1 = cn\varepsilon_0 E_{10}^2 c$

$E_2 = E_{20}\cos(\omega t - kz_2) \longrightarrow I_2 = cn\varepsilon_0 E_{20}^2$

Use: 5c has most of the relevant
Gas chamber/cell/thing is 100.

Probably a χ^2 for error, but not set or

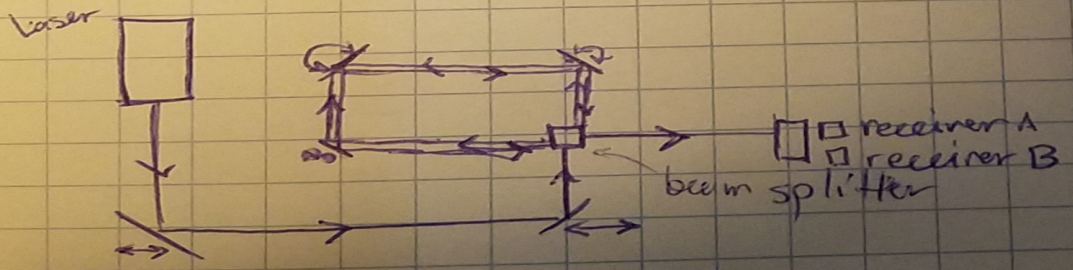
dist $\rightarrow d = N\frac{\lambda}{2}$ $k\Delta n$ $(\Delta n)L = d$ ← index of refraction, ← fringe count, ← cell length

$(\Delta n)L = N\frac{\lambda}{2}$ $2L(\Delta n) = N\lambda$ ← wavelength

$n = 1 + kp$ ← pressure, ↑ unknown $\Delta n = k\Delta p$ $k = \frac{N\lambda}{2L(\Delta p)}$

10 V = 1 atm
$\lambda = 633$ nm

Setup



Data

Run #	std (total)	slope v vs log(p)	k
2 Waves	0.0496	$\log(p) = 1.4\cdot10^{-4}v + 4.20$	$1.5\cdot10^{-5}$/atm
same as above 2 Optical			
(central fringe) → Try 2	0.5013	$\log(p) = 1.7\cdot10^{-4}v + 5.010$	$4.12\cdot10^{-5}$/atm
fuzzy/noisy → Try 3	0.4117	$\log(p) = 1.1\cdot10^{-4}v - 6.210$	