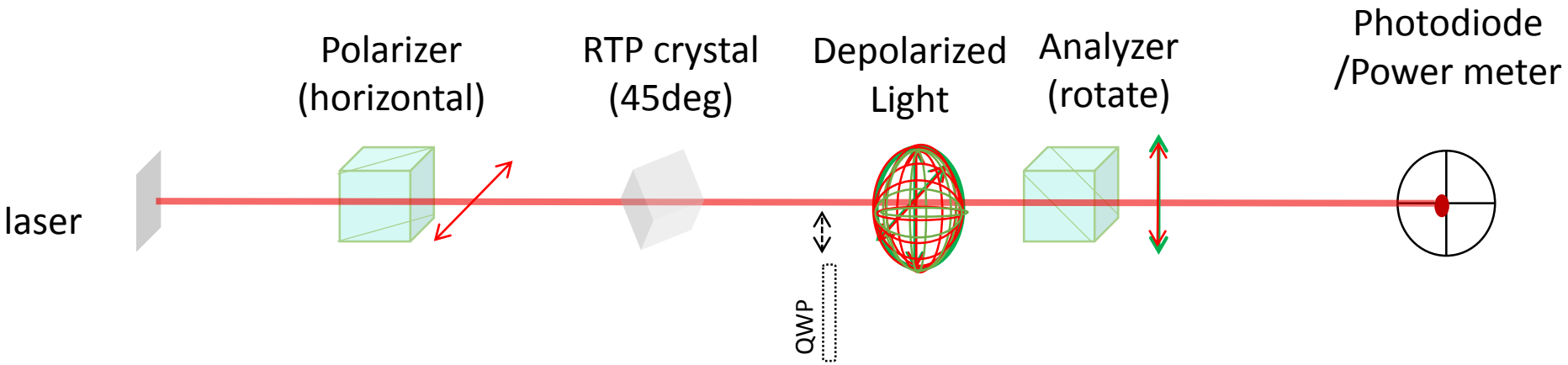
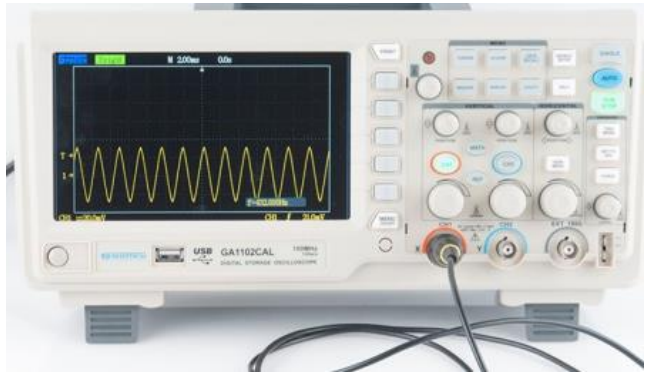
PQB Meeting

July 2016

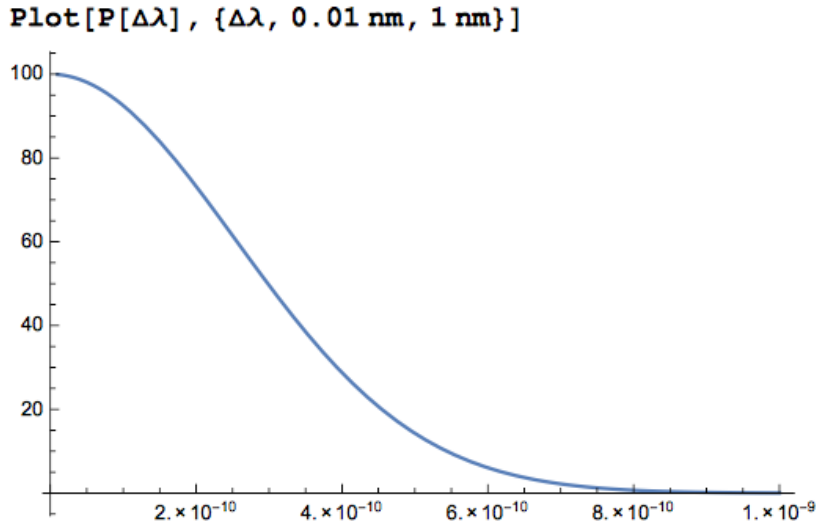
Linewidth Test Cell Setup





Laser Table

$$\sigma_{\Delta\lambda} = \sigma_I \frac{\lambda}{\Gamma_{calc}\,\mathrm{Sin}[\Gamma_{meas}]} = \mathrm{RMS}_{Transmission} \frac{0.108\ \mathrm{nm}}{\mathrm{Sin}\left[\mathrm{ArcCos}\left[1 - 2\,\overline{T}\right]\right]}$$



Goal - Determine line width is >1nm

When – After August 7

Materials - 5-10mW beam, 2 linear polarizers, QWP, photodiode, scope, power meter, 1 RTP crystal, IR card, IR viewer

Short Procedure summary – ~1hour

- Optics Alignment - 30min - align polarizer, analyzer, QWP, RTP crystal, photodiode
- Examine Scope to get rms fluctuations- 10min -Take 4 scope shots of pk-pk noise and mean on 1ms time scale and 100ms timescale for QWP in /out and analyzer at 90deg
- Measure powers to get % depolarization- 10min - Take 8 power measurements at different analyzer angles for QWP in/out and before/after optical elements
- Calculate: Convert pk-pk transmission noise to wavelength fluctuations via linewidth=RMST *0.108nm/sin(acos(1-2<T>)) [sensitive to <0.169nm]
- Calculate: Convert % depolarization to intrinsic line width via calibration plot already calculated [sensitive to <1nm]

Injector Measurements

Goal – Compare presummer(old laser) to postsummer(new laser) injector measurements

When – After Aug10, Bob Michaels – injector server

Need – 40-70uA stable beam, control of helicity settings, beam through bpm0R05, autogaining on bpms off, PC HV controls, PC translation controls, RHWP controls

Procedure summary – (previously took ~5-6hours)

- 1 BCM calibration – current calibration run (for bcm0L02)
- 1 BPM calibration – autogains off, current run
- 2 PITA scans for IHWP in/IHWP out
- 4 RHWP scans for IWHPin/IHWP out at 2 HV settings
- 1 longer run for RHWP and PITAV chosen settings
- (PC translation scan in X/Y)

BPM 0L02 ym wire channel

- Needs checking out

(Pete Francis?)