

# Faraday Tests of Pump/Probe with Samples (tvm & rxp)

- Implemented Pump Circular Polarization Modulation with Pockels Cell.
- Tested AOM Modulation of Mode-Locked Beam.
- Tested for Faraday rotation with two Samples (GaAs/GaAsP & Bulk GaAs).

## Observed Problems

- 1) Measurements are dominated by pump scattering from the sample surfaces (particularly bad with GaAs/GaAsP sample).
- 2) Pockels Cell Driver has HV breakdown on negative voltage side.
- 3) Sample quality is very poor. GaAs/GaAsP has hatchmarks. GaAs is very uneven in thickness and quality.

## Tests for Signal Verification

- Mode-Locked Signal but no CW signal.
- Signal disappears without Pump/Probe overlap.
- Signal shows Pockels Cell Voltage dependence. No signal with 0 V.
- Optimum Pump/Probe power ratio should be about 10/1.
- Signal with only Pump before Probe time delays.

## Best Results with GaAs/GaAsP Sample

Mode-Locked:  $V = + - 1500 \text{ V}$  (only 61 degree rotation)

Signal/Background  $\sim 70\%$  (Background = Probe Line Blocked).

CW: No evidence for signal

Linear Polarization: No signal.

No Pump/Probe overlap: No signal

## Best Results with GaAs Sample

Mode-Locked:  $V = + - 2200 \text{ V}$

Signal/Background  $\sim 70\%$ .

CW: No signal

Linear Polarization: No signal

Mode-Locked:  $V = + - 1200 \text{ V}$

Signal/Background  $\sim 22\%$

AOM Modulation is not competitive with Polarization Modulation.

As yet no wavelength tuning.

Robust signal currently is lost.