
Source and Accelerator Issues for MOLLER

Laser Table Development

RTP:

Pockels cell replaces previous KD*P - switches in $\sim 12 \mu\text{s}$

But - 10x birefringence, other qualitative differences from KD*P

Need new alignment techniques, may need to modify cell, or build one

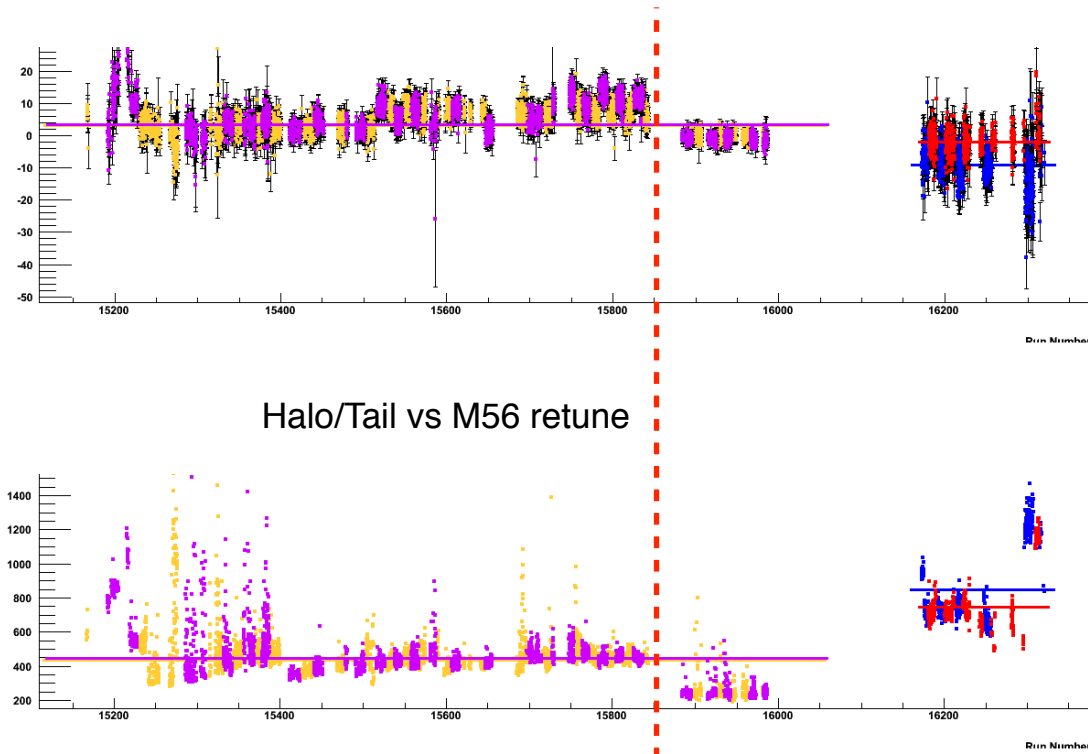
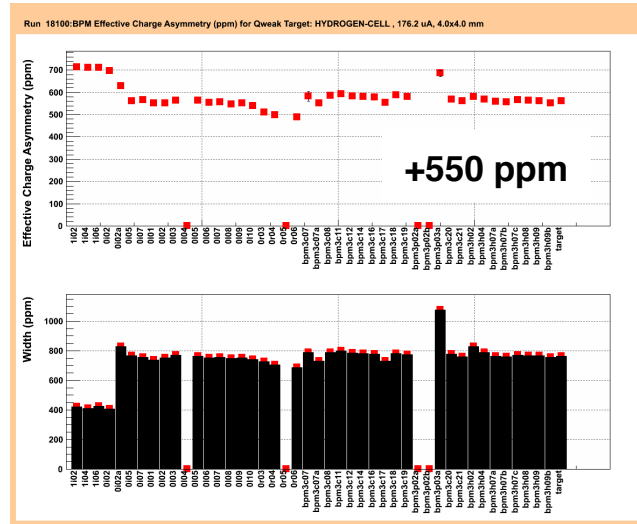
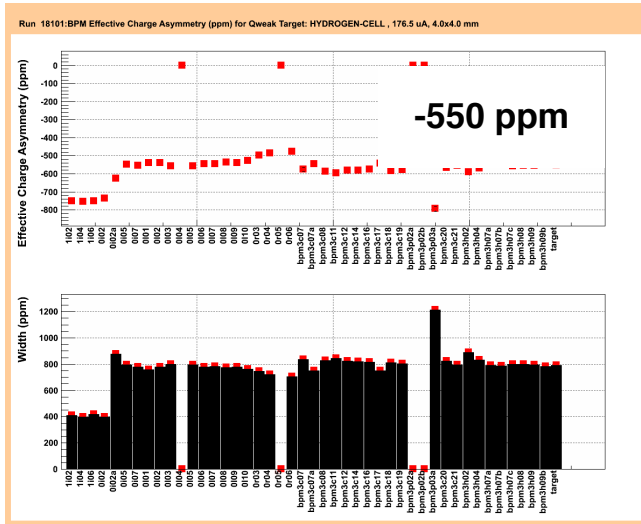
Dual Pockels cell:

- Provides additional (required) degree of freedom.
- Handling “S2” always required a work-around for previous installation - a 2nd PC deals with it directly
- Present RTP tests require a Babinet-Soleil compensator
- Can replace RHPW (but might still be helpful)

Basis for “pre-R&D” request: 2 cells, HV, mounting hardware.

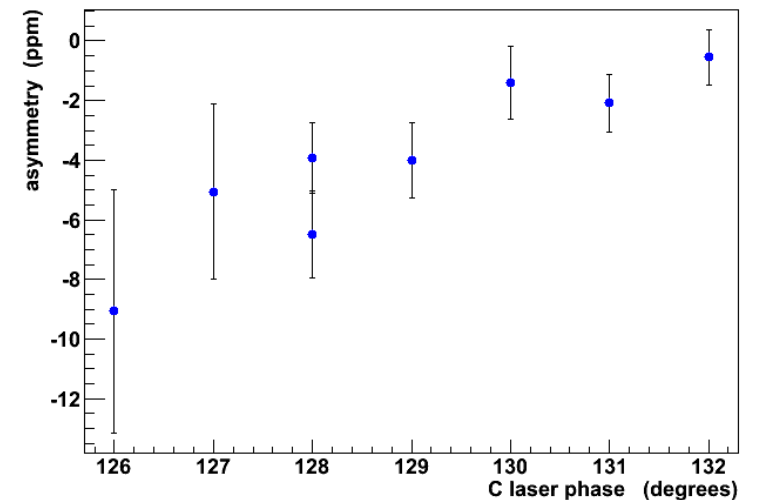
Qweak Experience

Asymmetry-dependent clipping in injector



Laser Phase vs. Background asymmetry

US lumi asymmetry versus C laser phase

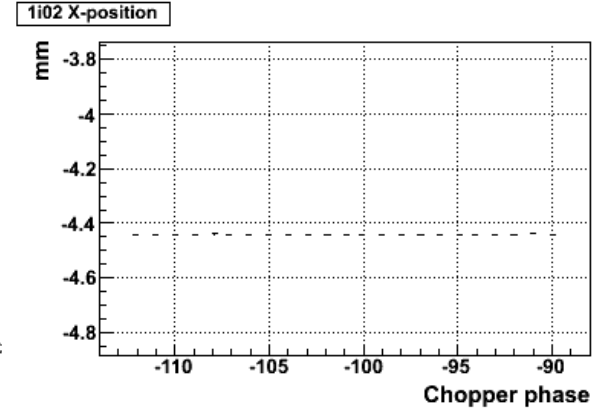
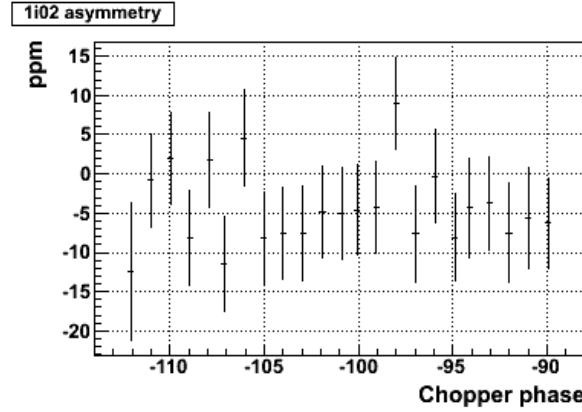
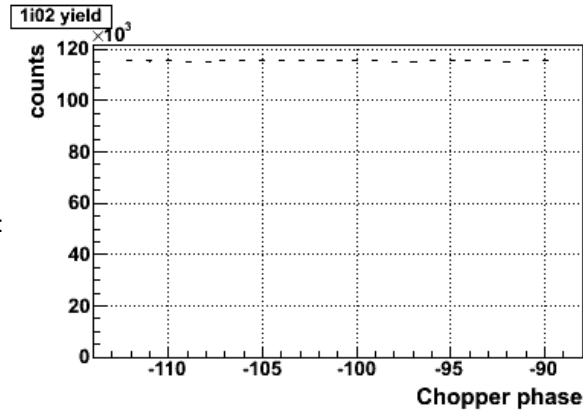


Asymmetry vs. bunch position

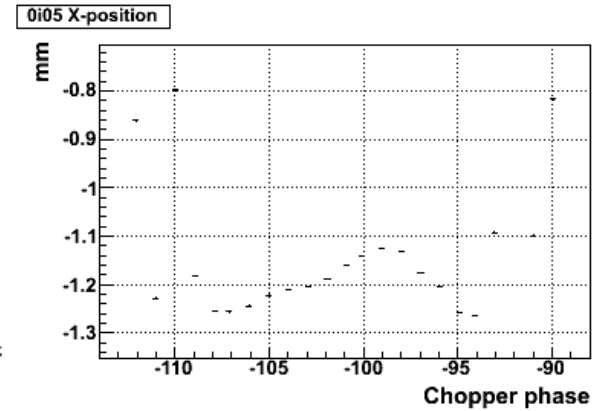
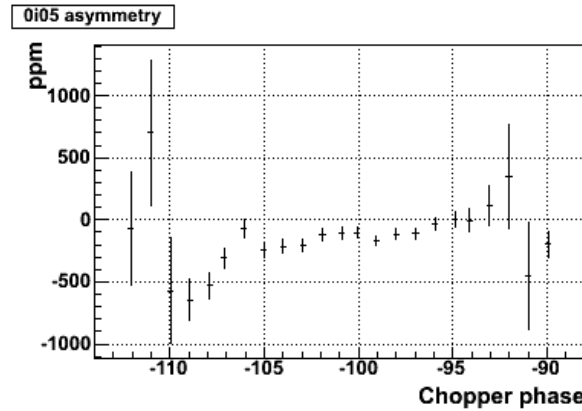
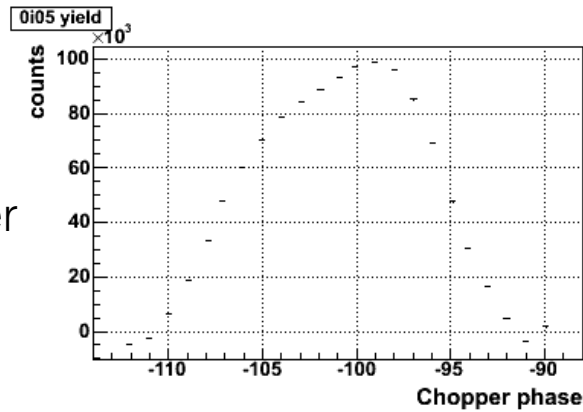
Narrow slit, scanning chopper phase to measure portions of each bunch

ELOG:Beam:259 [Manolis]

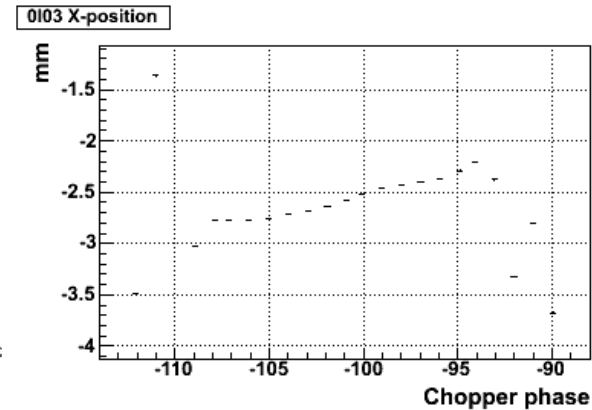
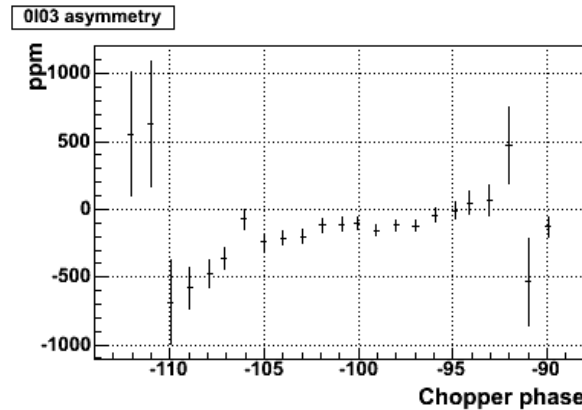
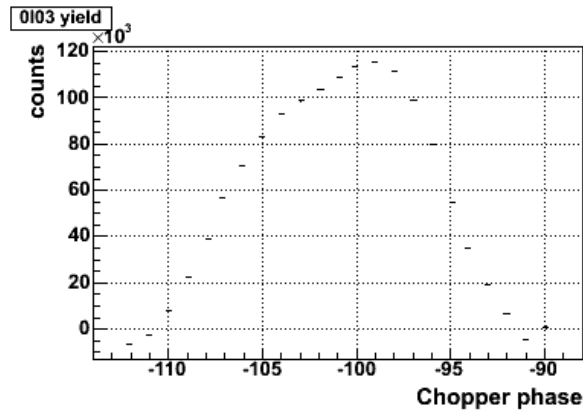
Upstream of chopper



After chopper



OL05
(5MeV)



Summary (Meeting Dec 17)

Arne, Matt, Joe, Yves, Jay, Reza, Alicia, KK, Kent, Paul

Issues raised regarding running at high energy

- o Depolarization at higher passes?
- o Energy-stability -> precession to the Hall? How large an effect might this be?
- o synchrotron radiation - beam width / clipping might be spin-state dependent?

Issues regarding injector

- o Matt points out that 249MHz (for 4-hall operation or multiple A/B/C 5th pass) requires 2x charge density. Approaches Qweak levels in injector.
- o Expected, by 2019: 200 keV Gun, new 1/4 Cryo.
- o Joe: more complete tests to learn limitations of present wien system will be very helpful.

Matching and optics (Yves) "phase trombone" is setup in Hall A line for 12 GeV (might also be possible for PREX)

Polarimetry

- o Spin dance? is pre-prex possible, with Hall C moller, Hall A moller and compton?
- o Arne asked about beam properties effect on polarimetry

Summary (Meeting Dec 17)

Arne, Matt, Joe, Yves, Jay, Reza, Alicia, KK, Kent, Paul

Future planning

- Should start regular (bi-monthly?) meetings
- Beam studies for PREX should inform MOLLER. This group should grow these ideas into well-formed plans. I
- Important to distinguish between
 - low-E injector studies (possible during accelerator down times)
 - studies needing entire machine (require dedication accel development time during run periods)
- Plan for summer: real "parity" setup on laser table, maybe tests in low-E injector.