PQB meeting

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Previously we determined….

- RTP achieves parity quality beam (<100nm,1st 8 bpms, 25uA)… for 10min
  - Aq e-beam drifts ~100ppm in ~30min
  - If we can make Aq drifts stable we can use it for PREX
- Stability (we have reason to believe) would improve with crystal Tcontrol
  - Tcontrol in the works, ordering parts
  - Feedback on PITAV in the works, would also fix stability in Aq
  - Feeback on Pos Diffs would make iterative process of setting PITApos voltages automated
- Moving Forwards
  - Charge feedback – *at least* – show can get stable Aq
  - T control on crystals – in the works…t controller, heater, thermocouple on *each* crystal
  - Delayed helicity – to be *sure* of any artificial offsets
  - 5MeV region- answer the Qu: which bpm is the best to minimize

RTP System Changes & Requirements

The improvements to the RTP system will include charge feedback, temperature control & improved gnd isolation.

Changes

- Charge feedback – software work in progress, modify for 8HV system
- Temperature control – new feature, new laser at Uva, work in progress
- 8HV system – improved gnd isolation within our 8HV box

Requirements

- 8 DAC channels
- Feedback software testing on the 8 DAC channels in advance required
- Reproduce August 2017 beam configuration (lenses), steering lens s.t. like Qweak run #2

Goals

PREX checklist - RTP

- Reproduce August 2017 laser beam configuration & PC alignment, Dx,y <100nm
- Steering lens change to reduce spot-size to that of Qweak run #2, Dx,y < 50nm
- Stability – Feedback & Tcontrol (in progress)

The overarching goals from now on are to first obtain PREX-level PQB with RTP, then obtain Moller-level PQB with RTP.

RTP long-SAD run goals:

1. Test stability of electron beam Aq with feedback on, evaluate position differences with feedback on, test stability of laser beam Aq with Tcontrol on

2. Evaluate position differences in the 5MeV region (are they also <100nm?)

3. Evaluate position differences at higher currents (are they also <100nm for 70uA(PREX)?)

Plan (3 day version)

- Day1 Morning - setup RTP on the laser table, test T control and Aq stability
- Day1 Afternoon- setup qpd, minimize position differences
- Day1 Evening- setup linear array, minimize spot size asymmetries
- Day2 Morning – e-beam at 25uA up through 5MeV region, current calibration run, PITA pos scans
- Day2 Afternoon/Evening- feedback on, iterate PITApos voltages to minimize pos diffs in 0I05, iterate PITApos voltages to minimize pos diffs in a select 0L region bpm.
- Day3 Morning – e-beam at 70uA up through 5MeV region, current calibration run, PITA pos scans
- Day3 Afternoon/Evening- feedback on, iterate PITApos voltages to minimize pos diffs in 0I05, iterate PITApos voltages to minimize pos diffs in a select 0L region bpm.
- Day3 - Night – remove RTP and put KD*P back in

Self-contained Temperature system – ver 1.0

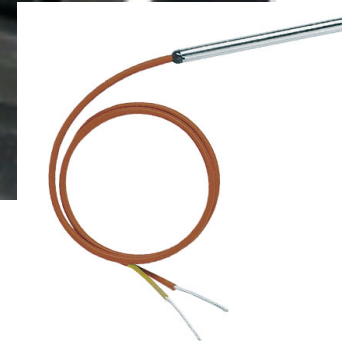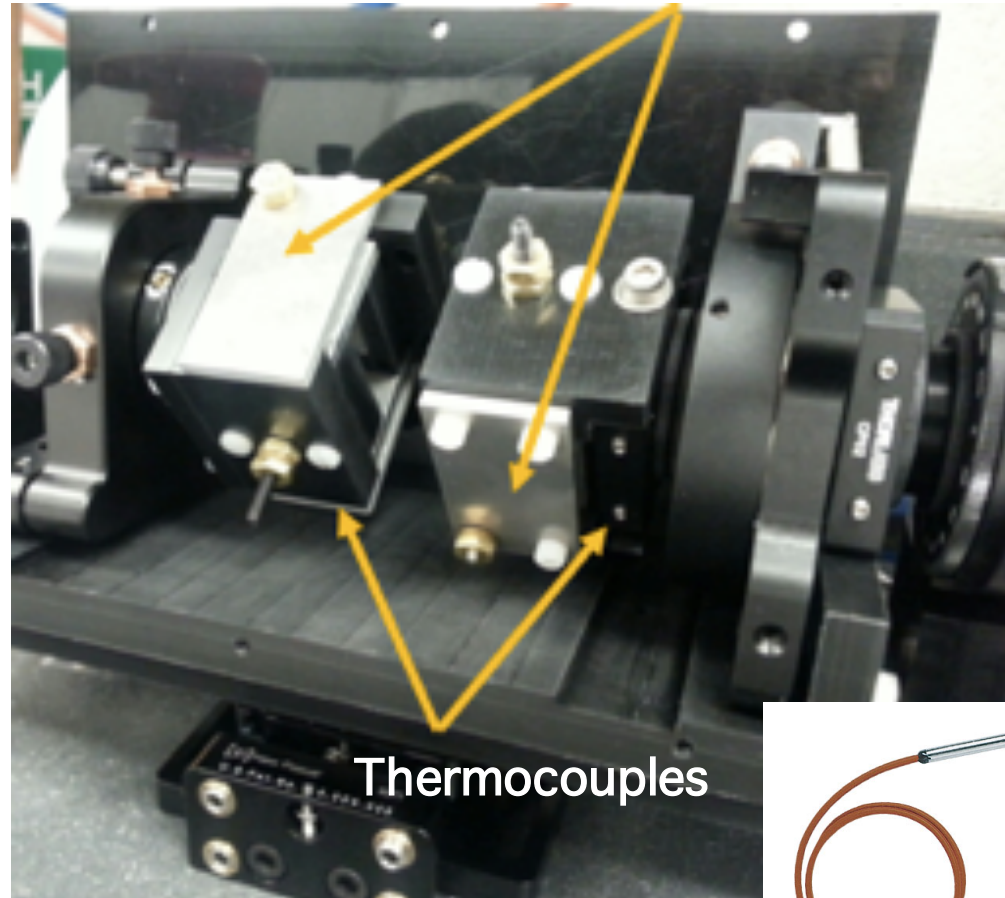**SOLO single-loop temperature controllers**

Resistive Heaters Thermal contact with Al side panels

Crystal 1

Crystal 2

Thermocouples

Scheduling

- ?

Shorter Plans

- 1day plan (achieve goal #1)
- -Evening (day before)- setup RTP on the laser table in the evening the night before e-beam running
- -Morning- e-beam at 25uA up through 5MeV region, current calibration run, PITA pos scans
- -Afternoon- feedback on, iterate PITApos voltages to minimize pos diffs in 0I05, iterate PITApos voltages to minimize pos diffs in a select 0L region bpm.
- -Evening – Try e-beam at 70uA up through 5MeV region, current calibration run, PITA pos scans
- -Night – remove RTP and put KD*P back in
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- 2day plan (achieve goal #1, #2)
- -Day1 Morning - setup RTP on the laser table, test T control and Aq stability
- -Day1 Afternoon- setup qpd, minimize position differences
- -Day1 Evening- setup linear array, minimize spot size asymmetries
- -Day2 Morning – e-beam at 25uA up through 5MeV region, current calibration run, PITA pos scans
- -Day2 Afternoon- feedback on, iterate PITApos voltages to minimize pos diffs in 0I05, iterate PITApos voltages to minimize pos diffs in a select 0L region bpm.
- - Day2 Evening – *TRY* e-beam at 70uA up through 5MeV region, current calibration run, PITA pos scans
- -Day2 Night – remove RTP and put KD*P back in