

# Injector Matching

**Motivation:** Lack of accurate modeling for the Injector RF components (mainly capture and cryo-components) resulted in poor transport. This caused amplification of parity-correlated orbits, which in turn compromised quality of parity experiment data (G0 HAPPEX, .....).

## Phased Approach (2004):

- Upgrade and debug all tools (phase 0) needed to ensure ability to
  - Accurately measure transport property
  - Implement tuning changes as predicted
  - Monitor machine changes in between
- Demonstrate phase 1 objective of damping 2 of the 4 PZT components (Spot movement on cathode)
- Measure cryo-unit transport to achieve well-behaved global transport independent of PZT patterns (phase 2).

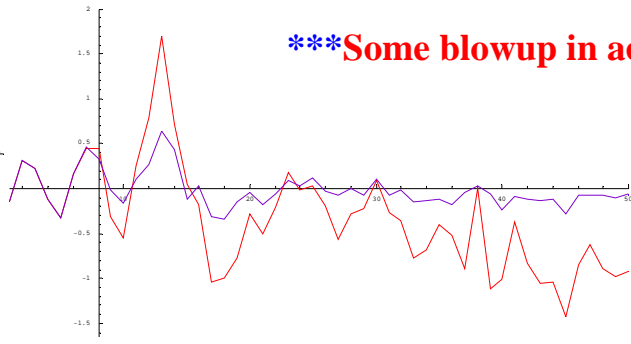
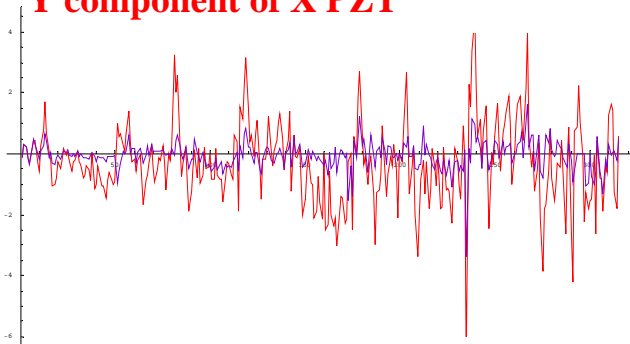
## 12/20/04 MD:

- 70  $\mu\text{A}$  CW was delivered to Hall C without tuning main accelerator.
- Beam spot was deformed at SLM's as expected.
- BLM trip started above 70  $\mu\text{A}$  CW at 1L02.
- PZT components happened not to be too orthogonal out of CU.
- Better 30 hz CS tuning in main accelerator could have helped.

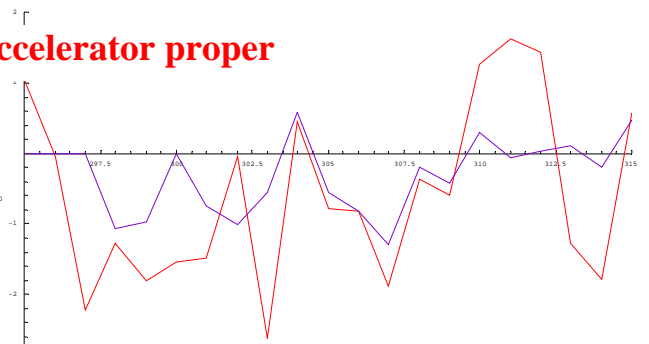
**Phase 1 objective is achieved**

(and surpassed thanks to both PZT X components being in phase)

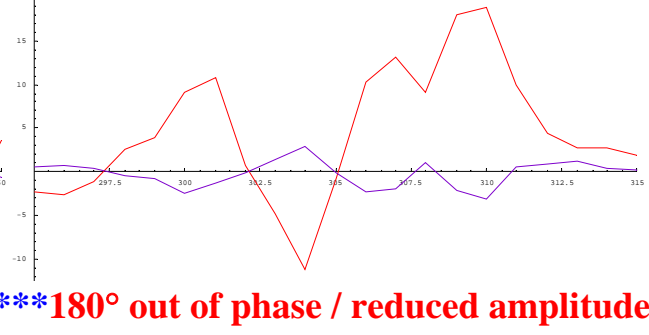
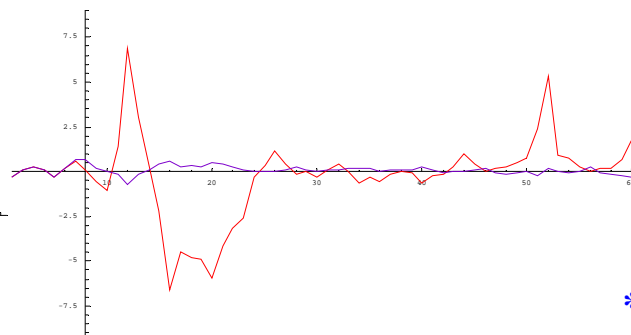
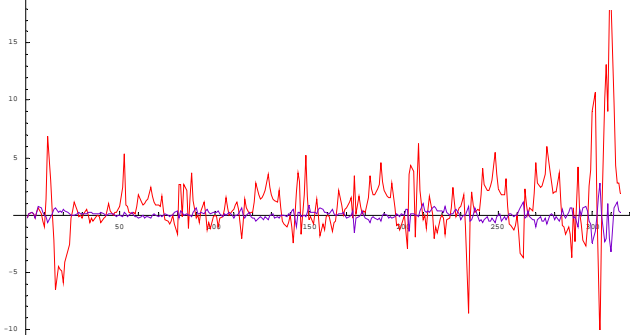
**Y component of X PZT**



**\*\*\*Some blowup in accelerator proper**

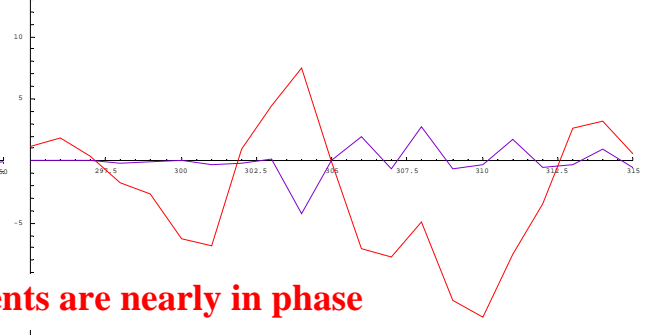
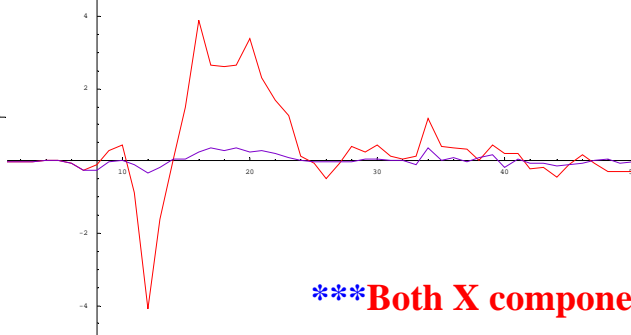
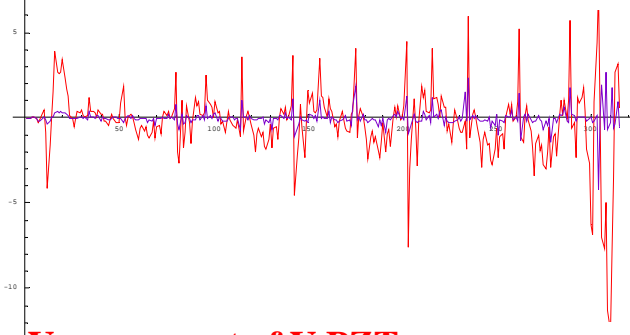


**X component of Y PZT (the worst offender)**



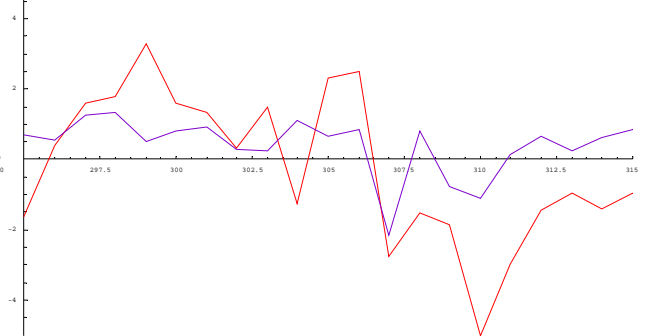
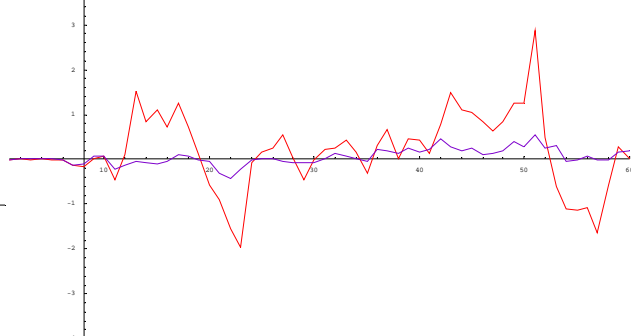
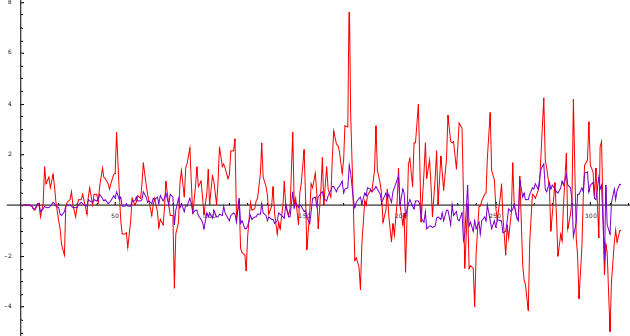
**\*\*\*180° out of phase / reduced amplitude**

**X component of X PZT**



**\*\*\*Both X components are nearly in phase**

**Y component of Y PZT**



## **January 2005:**

- **Observed considerable changes in PZT signature, mainly in loss of degeneracy between the PZT components.**
- **100 keV tuning being planned (R. Kazimi) to recover Dec. PZT pattern in assisting G0 damping measurements.**

**Moving on to phase 2 .....**