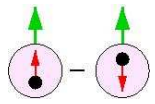


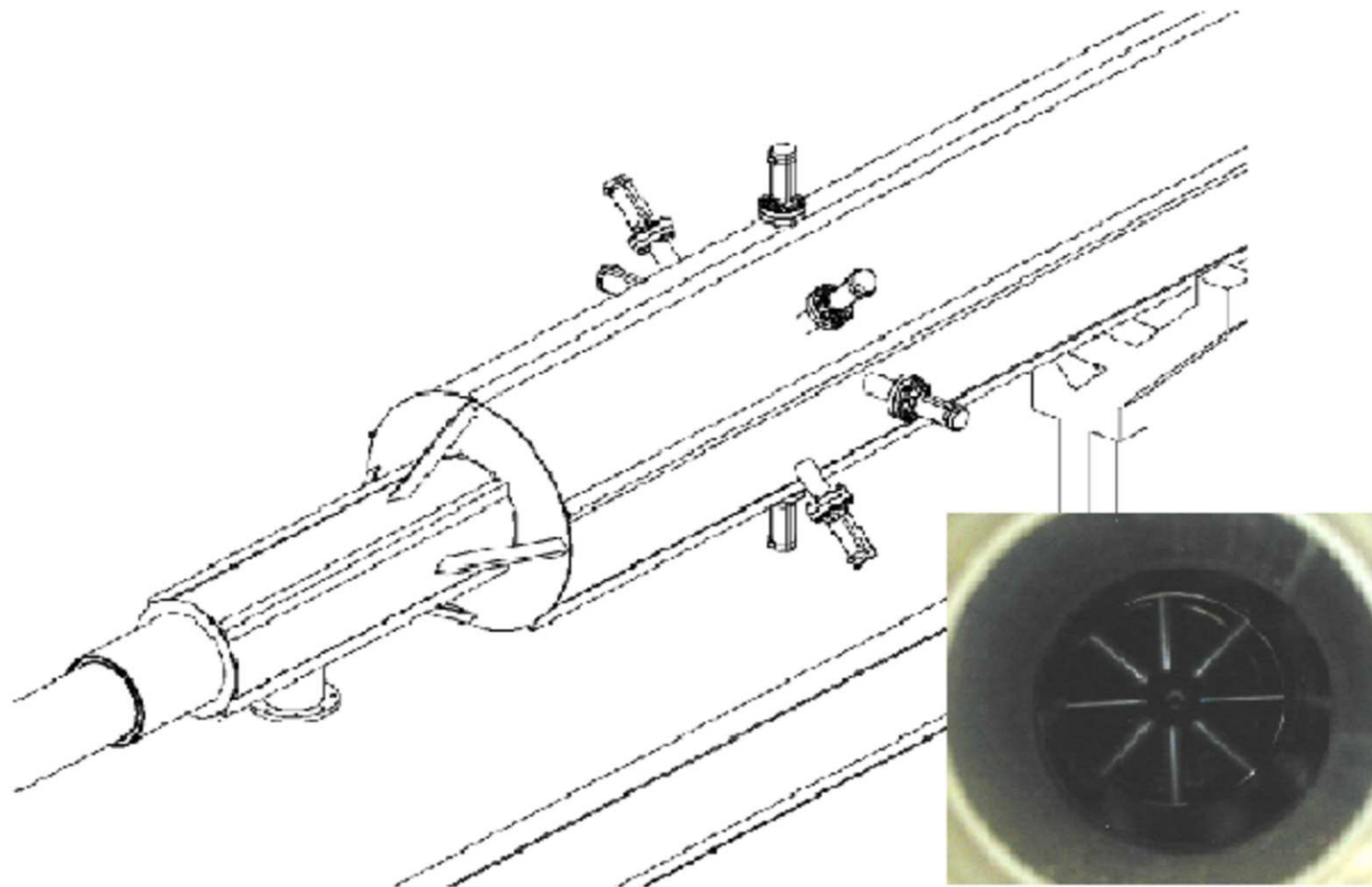
Happex Lumi-monitors, Beam Charge Feedback, and Integration into Transversity DAQ

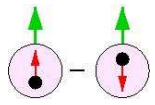
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May 02, 2008



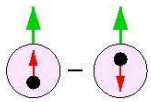
Hall A Luminosity Monitor



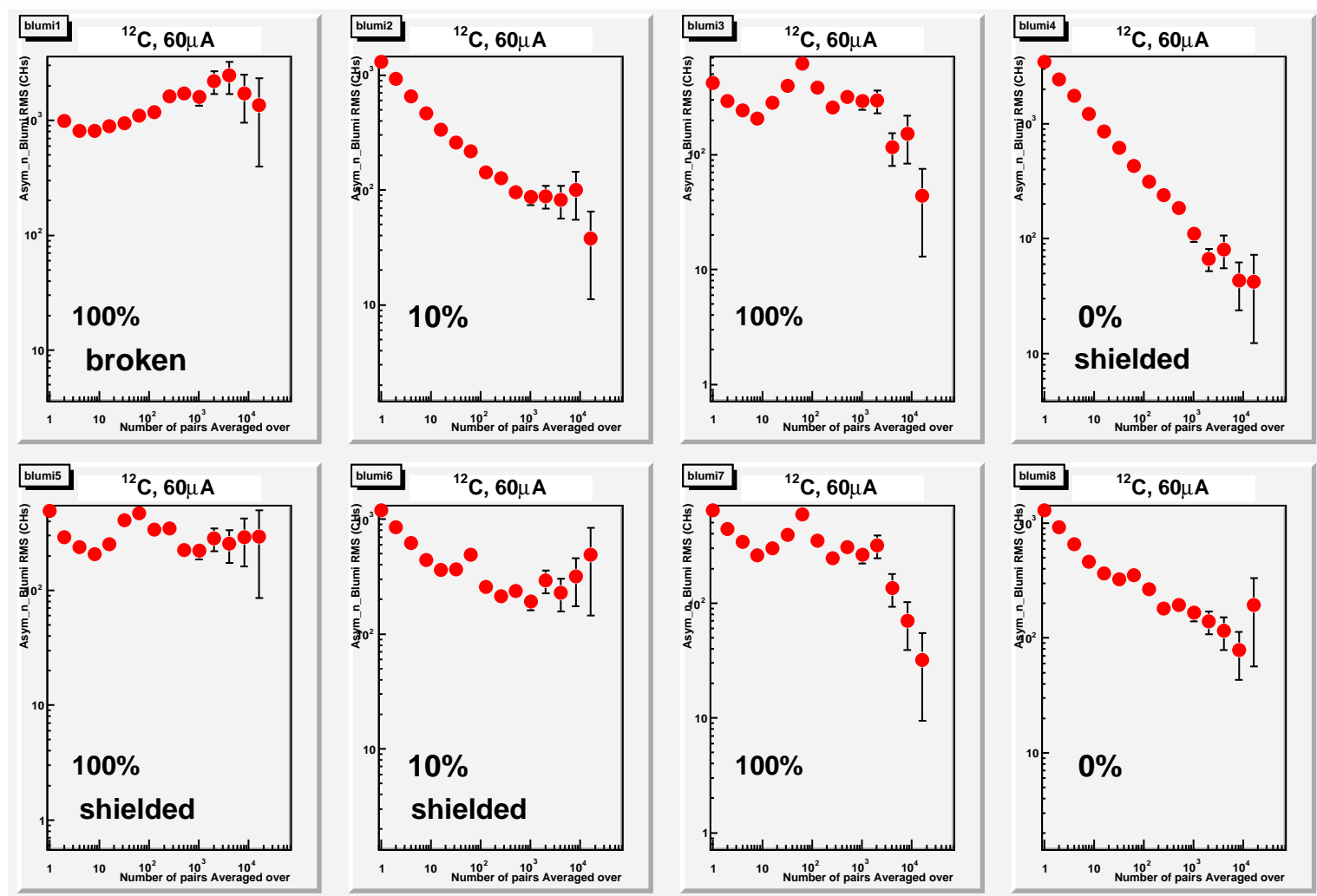


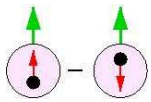
Hall A Luminosity Monitor

- Measures electron scattering rate at $\sim 0.5^\circ$ using integrating DAQ.
- Monitors relative luminosity at 10^2 ppm level for 30Hz beam helicity windows.
- Current design allows for neutral density filter between light guide and pmt – allows greater flexibility in optimizing pmt linearity under varied run conditions.
- From E03-004 proposal, longterm (10 - 20min) sensitivities estimated at the 50ppm level.

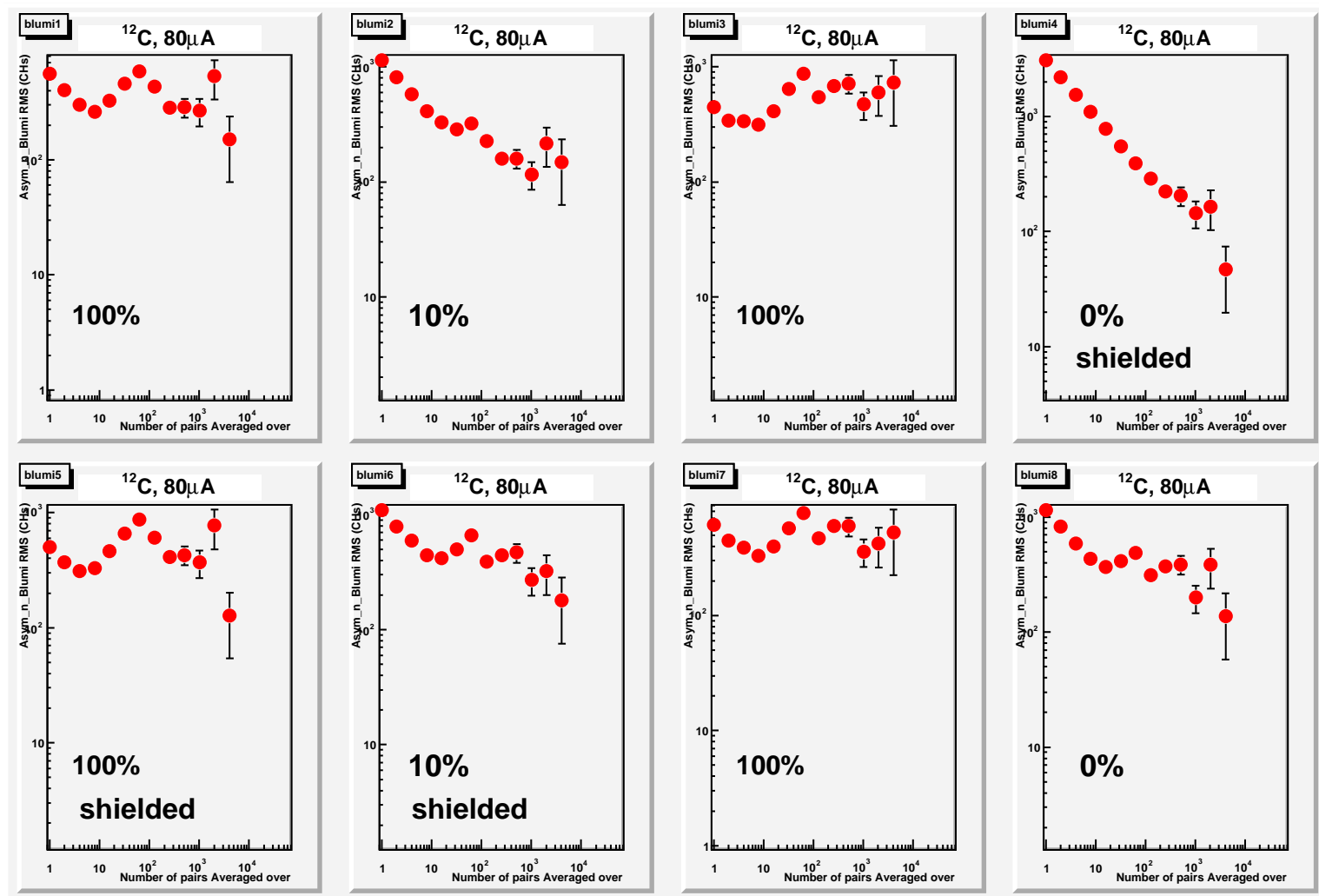


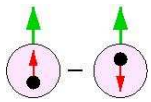
Longterm Sensitivities during PREX Beamtest



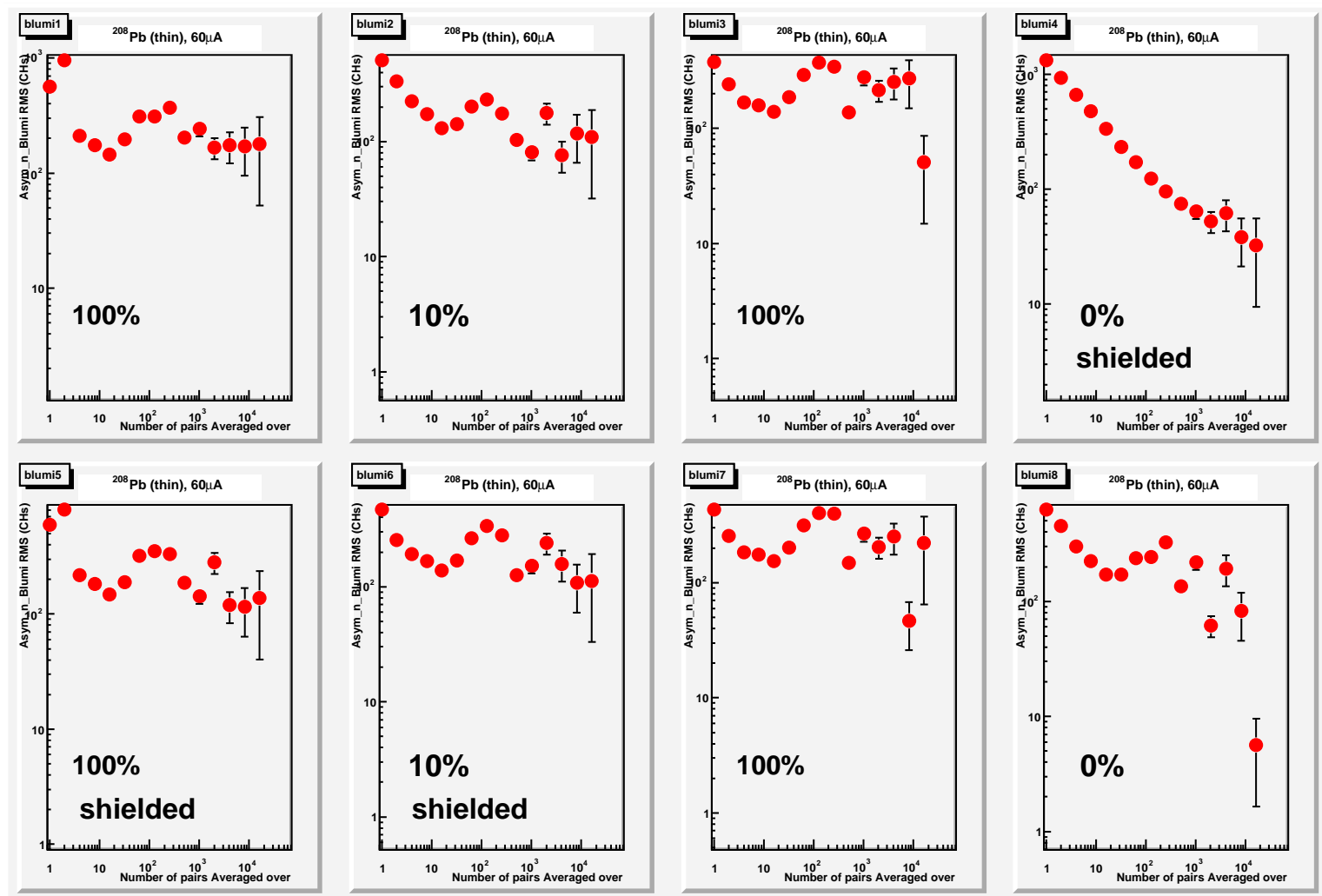


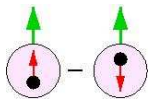
Longterm Sensitivities during PREX Beamtest



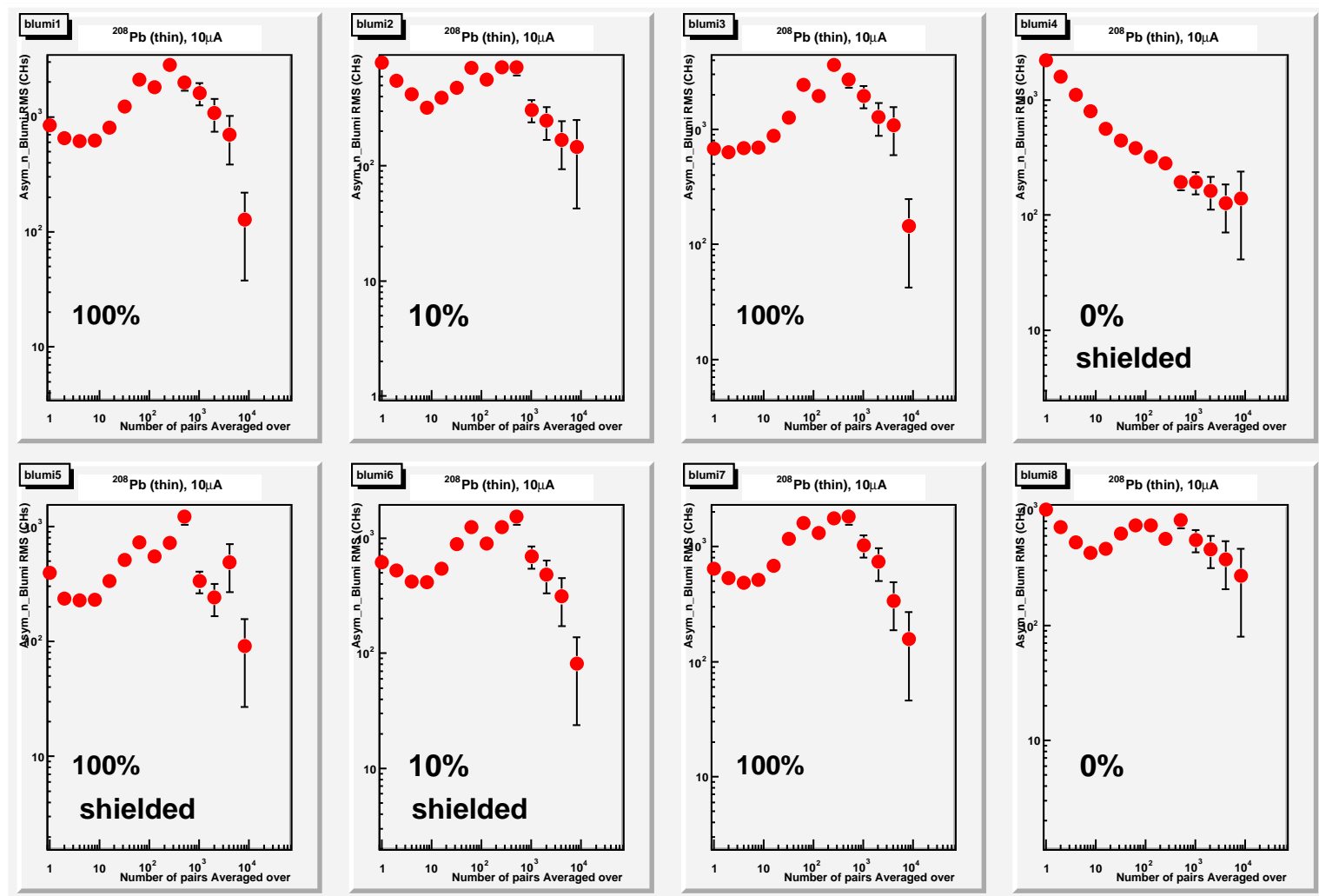


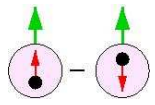
Longterm Sensitivities during PREX Beamtest





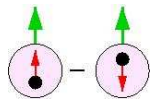
Longterm Sensitivities during PREX Beamtest





Beam Charge Feedback

- Controls the helicity-correlated average charge asymmetry.
- Using one of two methods:
 - Intensity Attenuator (IA)
 - Polarization Induced Transport Asymmetry (PITA)
- Feedback cycle of ~ 1 /minute with feedback slopes calibrated weekly or as needed.
- System designed to suppress helicity-correlated charge asymmetries on a 30Hz time scale.
- If we synchronize DAQs: Transversity could rely on Parity DAQ for charge asymmetry measurement.



Incorporating Lumi signals into Transversity DAQ.

- Run parity DAQ as usual.
- Use IO register to receive target spin information.
- Use reliable server running on VME crate to collect the data (target spin and lumis).
- A Linux client (using ET system) grabs server stream and puts it into HRS DAQ.
- Lumi data then essentially looks like a scaler bank in HRS DAQ.
- Can verify reliability of server results by comparing with HAPPEX DAQ.