

Spin Flipper @ Store

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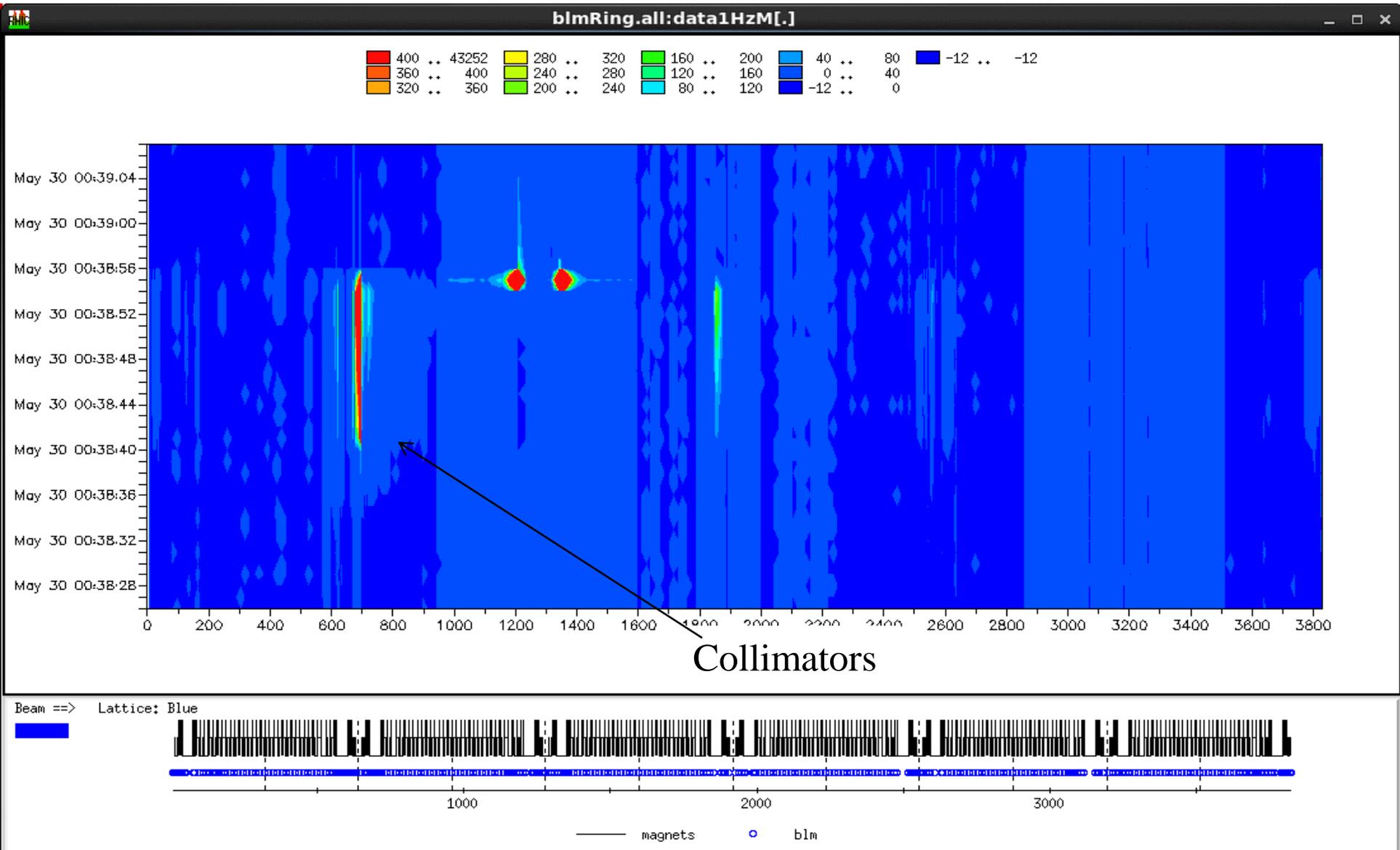
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APEX Meeting

Experiment Procedure

- We started first at the end of store. The plan was, taking beam out if collision, making necessary tune adjustments, ramp from pp17-sq0::store to pp17-sq1::store (ramping up the gamma_tr) with feedbacks. But it failed after forty minutes setup work. Beam was lost 22 seconds into the ramp. It was suspected due to larger beta function at quadrupoles with high betas. After beta squeeze and a long store, larger beam size at these quads prevented turning on gamma_tr quads at the end of store.
- We then waited for four hours of spin tilt study near injection.
- We ramped 111 bunches in blue and yellow to store. From last store measurement (May 3rd), the spin tune was around 0.499-0.5. We still got spin partially flipped (~-30%) with sweeping driving tune 0.495-0.5. We then swept driving tune outside this range, spin did not flip sign but some polarization loss, similar to last time. The spin tune is between 0.495-0.5, but we could not get closer estimate.
- Dispersion was measured twice at store for D' lattice: $\Delta D' = -0.0031$ and -0.0028 , respectively.

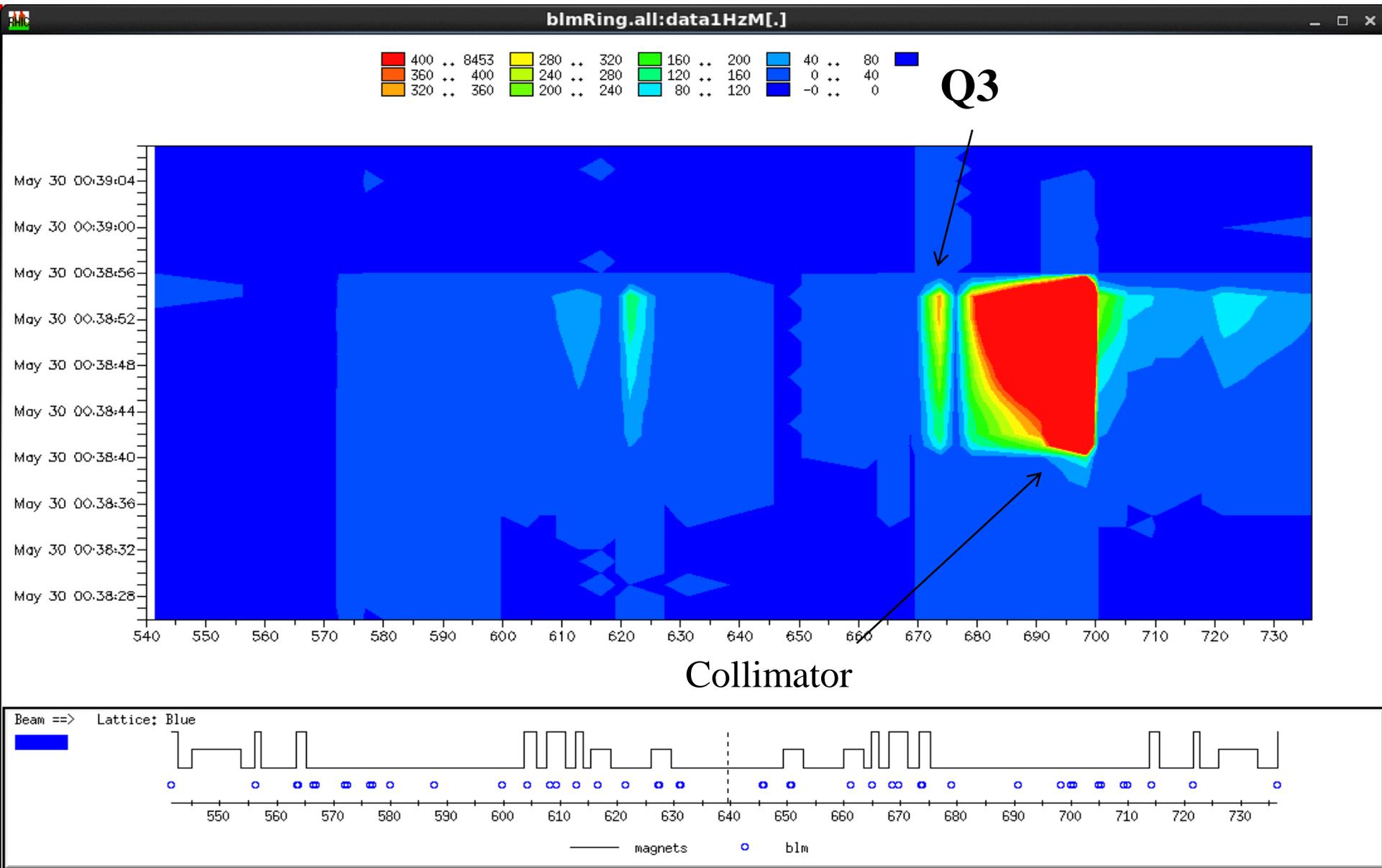
Beam Losses at Quadrupoles



10925 arrays successfully read and displayed

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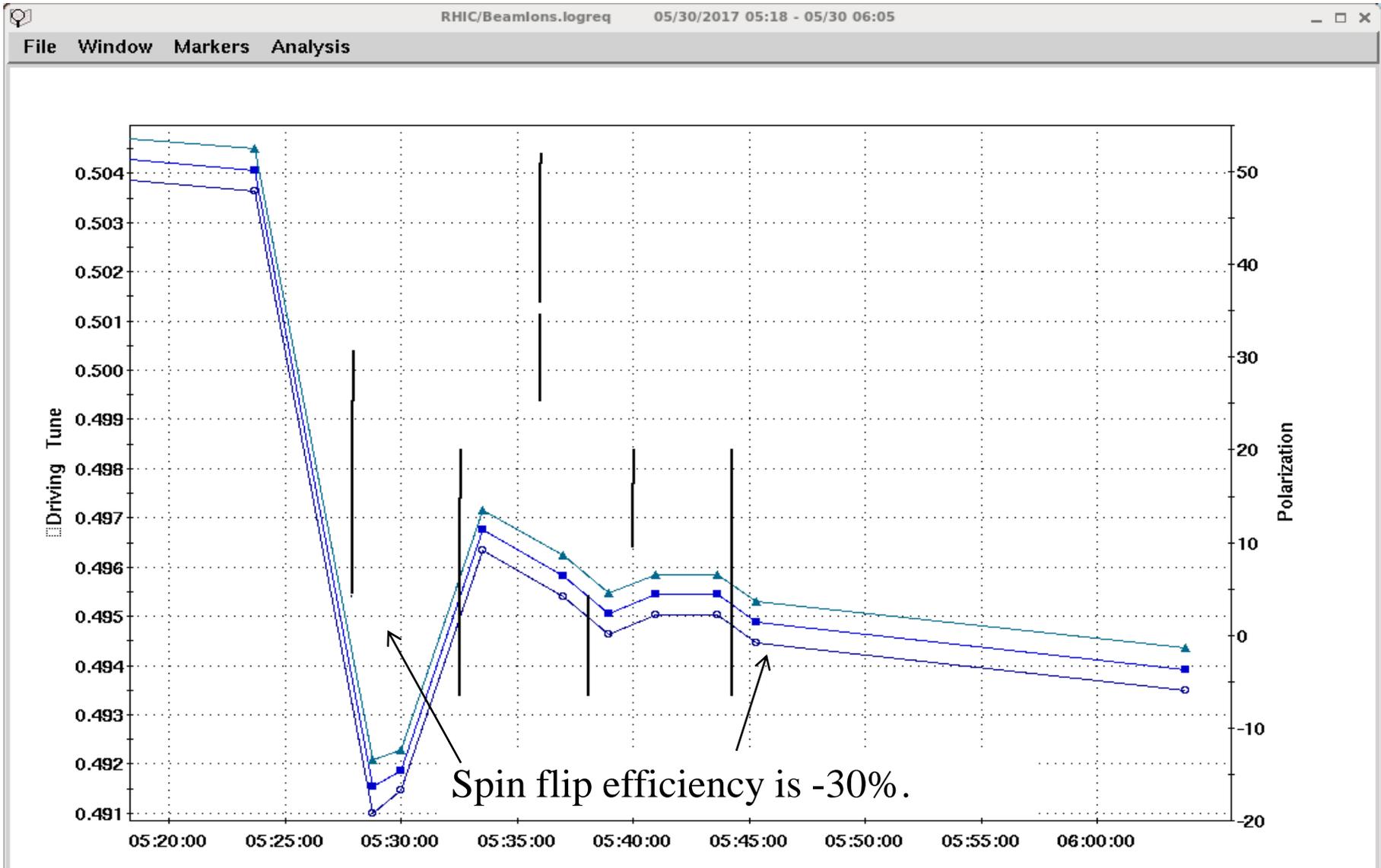
Beam Losses at Quadrupoles (zoomed in)



10025 arrays successfully read and displayed

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Polarization and Driving Tune Sweep (3sec)



the vertical black bars show the driving tune sweep range.

FATAL ERROR during cell calculations - ERROR: there is no dataset with this name -> ireq
Not all necessary data was available for cell calculations.

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Plan

- We got $\Delta D' = -.003$ while aiming 0. We can scan the settings to get smaller $\Delta D'$ at store.
- The simulations show good spin flip at store with D' lattice. One difference is that the ramp up time was 1.5sec in reality, but 3000 turns in simulation. How fast can we ramp the current?
- Use simulation tool to find sensitive parameters first.